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ANNUAL REPORT

OF THE

State Engineer and Surveyor

OF THE

STATE OF NEW YORK

For the Fiscal Year Ended September 30, 1910

TRANSMITTED TO THE LEGISLATURE JANUARY 27, 1911

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STATE OF NEW YORK

No. 23.

IN ASSEMBLY

JANUARY 27, 1911.

ANNUAL REPORT
OF THE
STATE ENGINEER AND SURVEYOR
OF THE
STATE OF NEW YORK

OFFICE OF THE STATE ENGINEER AND SURVEYOR,

ALBANY, N. Y., *January* 27, 1911.

To the Honorable the Speaker of the Assembly:

Sir.— I beg to submit herewith, without comment or recommendation, the annual report of my predecessor, Hon. Frank M. Williams, for the fiscal year ended September 30, 1910.

Very truly yours,
J. A. BENSEL,
State Engineer and Surveyor.

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OFFICE OF THE STATE ENGINEER AND SURVEYOR,

ALBANY, N. Y., *December* 31, 1910.

Hon. J. A. BENSEL, *State Engineer and Surveyor-elect:*

Sir.— I inclose herewith, for transmittal to the Legislature, my annual report for the fiscal year ended September 30, 1910.

Very truly yours,
FRANK M. WILLIAMS,
State Engineer and Surveyor.

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REPORT.

To the Honorable the Legislature of the State of New York:

I have the honor to present herewith my second annual report as State Engineer and Surveyor.

The people of the state have entrusted to the State Engineer and Surveyor a work which makes his department one of the most important in the State government; they have directed him to expend for them a vast sum of money in carrying out an enterprise which, in the light of results attending similar improvements in Continental Europe, as well as along our own Great Lakes, seems destined to be a most important factor in our material prosperity.

The making of this report, therefore, becomes, not an imposed duty, but a welcomed opportunity of telling to you and through you to the public what is being accomplished in this great undertaking. Indeed, I may add that throughout my administration I have sought for occasions to keep the people informed concerning this work which they have ordered.

Although the most important work now engaging the attention of the State Engineer and Surveyor is the enlargement of the State canals, this enterprise by no means comprises the whole of his duties. The Constitution of the State and the Revised Statutes impose on him certain fixed duties and at each session of the Legislature numerous laws are passed which add to the obligation. In brief, these duties may be described as consisting of the engineering operations required in the making of surveys and preliminary investigations and in the designing of certain State public works and the supervising of their construction and maintenance.

The several constitutional and permanent statutory boards of which the State Engineer and Surveyor is a member are the following: Canal Board, which controls the construction and maintenance of the canals; Commissioners of the Land Office, who control the sale and purchase of State lands and the granting of lands under water; Board of State Canvassers, which canvasses the returns of elections, and the Board of Equalization of Assessment, charged with equalizing the assessment of State taxes among the several counties. From the nature of this office, matters of a technical character that come before these boards are referred to the State Engineer and Surveyor for investigation and report.

Besides these boards the Legislature often creates commissions for some particular work of investigation, and of these the State Engineer and Surveyor is sometimes a member. There is one such body now in existence — the Barge Canal Terminal Commission — created by the Legislature in 1909 and continued for a second year at the succeeding legislative session. The work of this commission, of which the State Engineer and Surveyor is chairman, has demanded a large share of his time, but the subject is well worthy of all the labor expended upon it, both by all the members of the commission and by the many public-spirited citizens who have become interested, since the State's policy in regard to adequate terminal facilities for its great shipping interests is a question of supreme moment to our commercial supremacy, although probably but a few of the people realize its importance.

Because of the nature of the State Engineer's office there are certain duties that have come to be his, by legislative enactment or otherwise, in addition to those which emanate from his relation to the State waterways and his membership in the several boards and commissions. Without going into detail, the most important of these may be enumerated as follows: Growing out of his supervision of canal construction, he is accustomed to make surveys and maps for the Attorney-General and to present expert technical evidence in the defense of suits before the Court of Claims; he is also required to examine and pass upon bridge plans presented by electric or steam railways or others for use in crossing the canals. In connection with his membership in the Land Office Commission, he is entrusted with the sale of lands at public auction, having a Land Bureau in his department, which is the custodian of many original maps and descriptions of Colonial and early State surveys. Because he is the engineer for State works in general, he is charged with the direction of the geological survey of the state in coöperation with the United States Geological Survey, including topographic surveys and the gaging of flow of streams; by statute he is authorized at stated intervals to inspect and report upon the condition of the monuments along the state boundary lines; by special legislation he is often directed to survey and monument the boundary lines between counties of the state or between New York and adjacent states or Canada; when the various State boards, commissions or departments have work that demands engineering knowledge, all but the few which have engineering corps of their own, request the State Engineer and Surveyor to make the necessary surveys, estimates, plans or investigation; he is often called upon for information by the Legislature, especially during the session, being asked to furnish estimates and reports on proposed legislation.

In making my report of the several undertakings intrusted to my care, I shall take up each in order, following the form of preceding reports. A year ago I called your attention to several matters that demanded legislative enactment. For one reason or another provision was not made for some of these, but the necessity for action is as imperative as ever. Accordingly I shall repeat certain of these recommendations and shall add others, the need of which another year's work had demonstrated. It seems probable that sooner or later the State must of necessity carry out these suggestions, and nothing is to be gained by delay. I would therefore commend these subjects to your careful consideration.

CANAL MAINTENANCE.

During the past year the maintenance of the present canal system has been continued under the provisions of general and special acts of the Legislature, the design and construction of new works having been in charge of the State Engineer, while the work of ordinary repairs has been done by the Superintendent of Public Works.

Throughout a considerable portion of the canal the line of the Barge channel coincides with the present canal. As navigation must be maintained, the work of enlargement at these places is often carried on under unfavorable conditions and special care and watchfulness must be exercised. I am pleased to report that the Barge canal work has been performed in such a manner that during the year there has been no break in the vicinity of these operations and consequently no interruptions of traffic chargeable to the new work.

The Superintendent of Public Works is to be commended for the excellent condition of the State canals and the creditable manner in which they have been maintained.

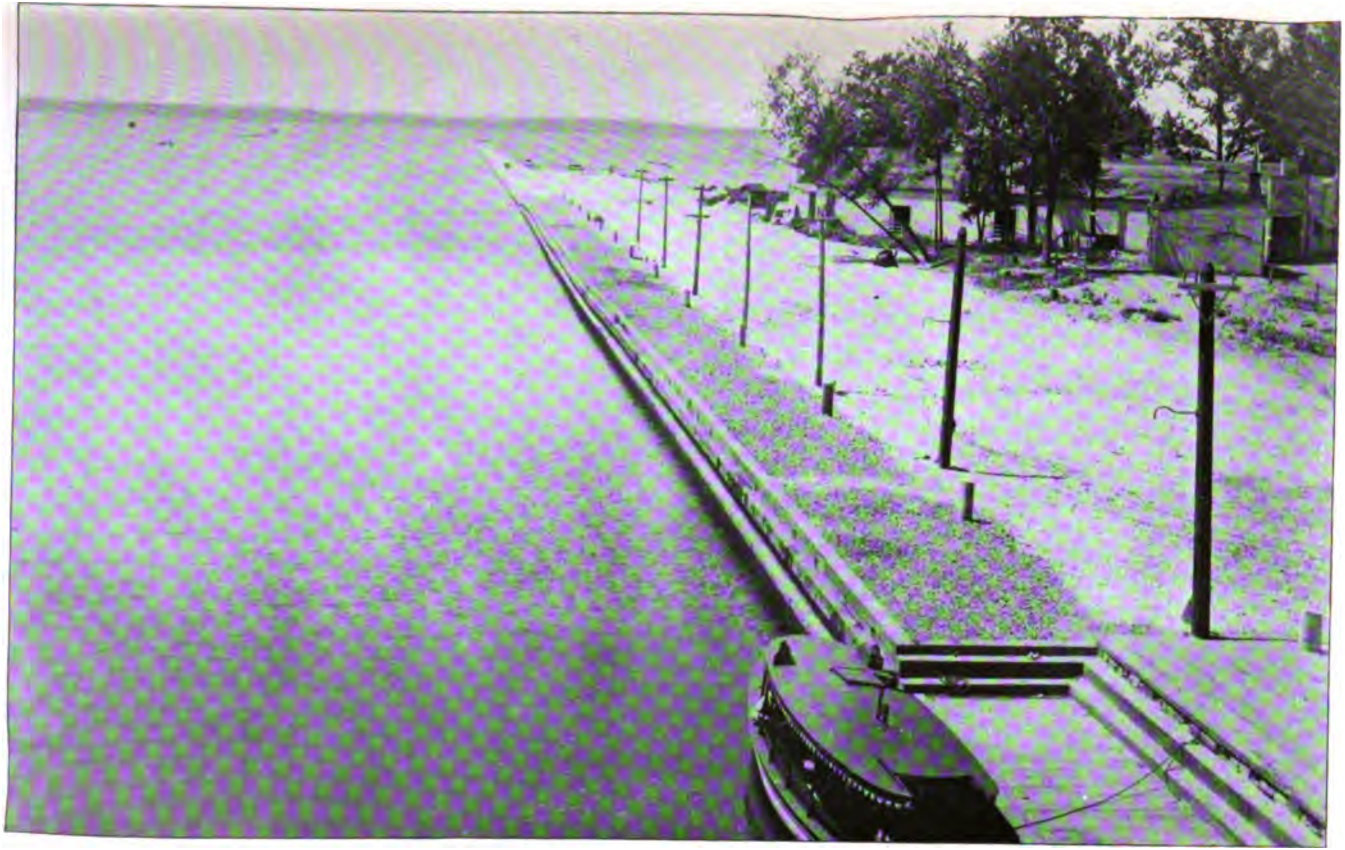
BARGE CANAL.

I am pleased to report that nearly the entire Barge canal system, including all four branches — the Erie, the Champlain, the Oswego and the Cayuga and Seneca — is either under contract or construction has been completed. As the following paragraphs will show, the work of planning and building the canal during the past year has been unprecedented in amount in the history of the enterprise.

STATUS OF WORK.

At the end of 1910 about one-third of the work of construction on the whole canal is completed. There are under contract 422.2 miles of canal (including the Cayuga and Seneca), besides contracts for various electrical installations, bridges, dams and other structures, two great storage reservoirs and a feeder of nearly six miles leading from one of them. Of the remaining work, plans for 7 miles are completed, while those for 2.3 miles are at least three-quarters finished and those for 9.1 miles of canal and for the Glens Falls feeder are well under way. Thus it is seen that about 96 per cent of the canal mileage is under contract.

With the exception of various minor structures, operating machinery and the like, there remains to be contracted for: Two sections of less than a half-mile each, one at either end of the Erie canal, a stretch of about two miles at Medina, the spur of seven miles to Syracuse, including five miles of lake navigation, the arm of 3¼ miles in the Genesee river, together with a dam, to form a harbor for Rochester, and some five and one-half miles of the Cayuga and Seneca canal. Thus, the Champlain and Oswego canals are under contract throughout their entire length, the extent of the Erie is broken only by a gap of two miles at Medina



Barge Canal, Contract No. 4.

Completed pier at Sylvan Beach, at entrance of Barge canal into eastern end of Oneida lake.

and by half-mile stretches at each end, and the 23 miles of the Cayuga and Seneca is three-quarters contracted for.

The value of work under contract, at contract prices, or completed, amounts to $72,710,553, exclusive of the Cayuga and Seneca canal, and at the close of 1910, $25,869,723 has been earned on construction work.

The contractors on eight pieces of work have completed their tasks. Although the mileage of these eight sections makes no great showing in the whole extent, several of the large contracts are so well advanced that the combined stretches of nearly finished canal amount to a considerable percentage of the entire length.

I have at hand plans prepared for the construction of the section of canal at Medina, which is not yet under contract, but inasmuch as this involves the building of a concrete arch of dimensions hitherto not equaled in this country, I have refrained from placing this section under contract, because I believe that in so unique a plan the engineer responsible for the design should also have the opportunity to carry out the construction. Therefore, I have left this matter to be determined by my successor.

The same thing is true of the proposed dam at Scotia on the Mohawk river, which is now under contract to the Pittsburg Eastern Company. The location of this dam is such that some difficulties attended its construction and the contractors have petitioned the Canal Board for a hearing, to the effect that they be relieved from that portion of their contract.

I do not believe it to be for the best interests of the State to so relieve them, and during the summer formulated plans which in my judgment would facilitate this construction.

However, inasmuch as I would not have the opportunity of carrying out these plans, I have deferred taking any drastic action, leaving the entire matter to my successor. Meantime the contractor has progressed work and has nearly completed the two remaining dams covered by his contract.

RECORD FOR 1910.

It was expected that 1910 would make a better showing than any of its predecessors and it did not fail in this respect. During the year construction work to the value of $9,578,408 has been done, and 107 miles of canal have been put under contract, besides the great storage reservoir at Hinckley and a feeder 5.75 miles long, to divert its waters to the Rome summit level.

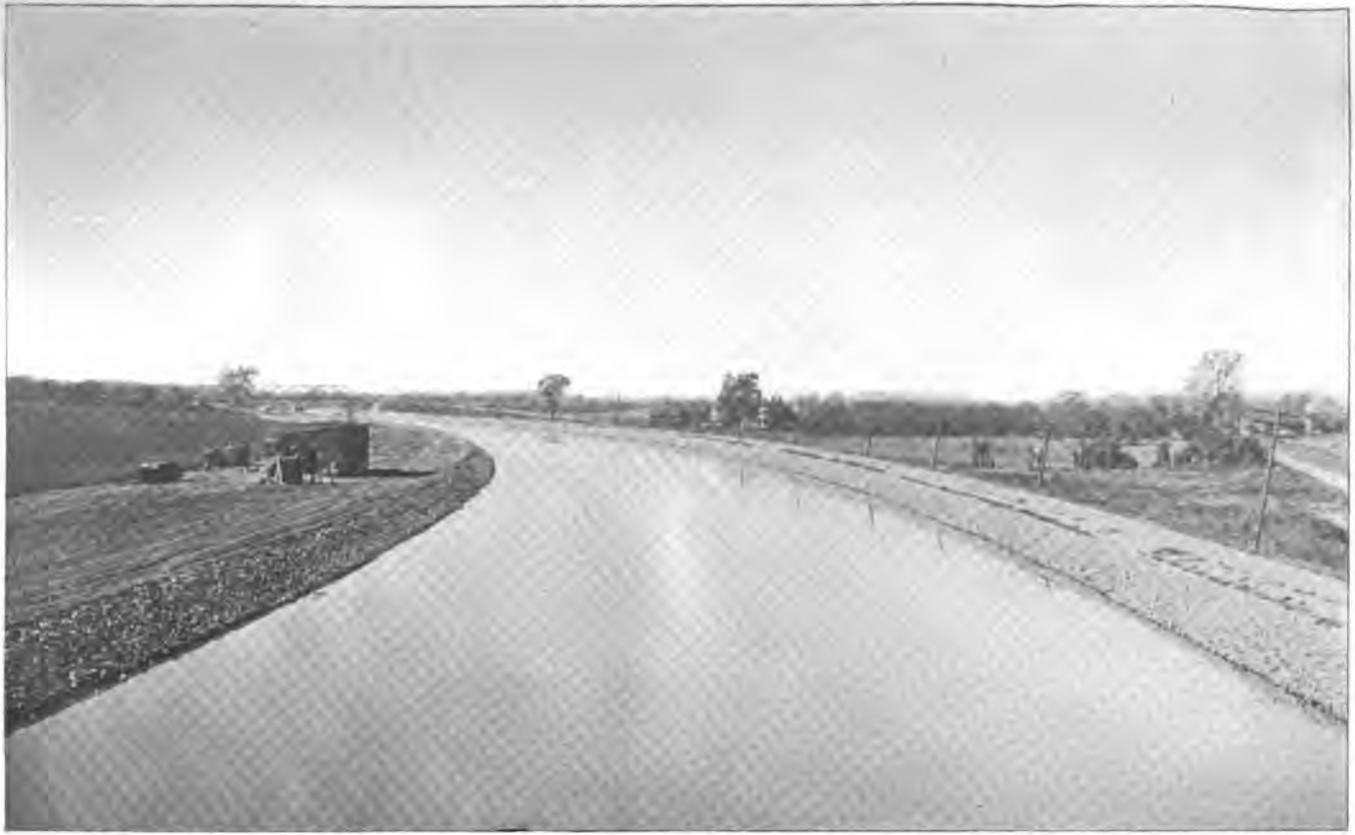
From the figures for former years ($330,120 in 1905, $711,490 in 1906, $2,216,300 in 1907, $5,443,303 in 1908 and $7,590,102 in 1909) a comparative view may be obtained. In the years 1909 and 1910, the period of my administration, the value of work done, $17,168,510, is seen to be twice as large as that for the whole period of work (four years) that went before. Also, studying the mileage table of contracts let (23.9 miles in 1905; 43.6 miles in 1906; 59.5 miles in 1907; 67.1 miles in 1908, and 121.1 miles in 1909) it may be seen that the miles of canal awarded during these two years of 1909 and 1910 is 54 per cent of all that under contract to the present time, or 52 per cent of the mileage of the whole undertaking.

When the amount of work done in 1910 is considered, it must be remembered that many of the large contracts have been let so recently that actual construction has not yet started or has but just begun. Even on the great dredging contracts on the Mohawk river, that were awarded more than a year ago, the work has scarcely begun, so extensive plant installations being required that the machines are still in the trying out stage, before acceptance from the builders.

WHOLE CANAL WITHIN ORIGINAL APPROPRIATION.

At the end of another year, I repeat the statement that the whole canal can be built within the original appropriation. Since 96 per cent of the entire length of the canal is under contract at prices aggregating between two and three million dollars less than the appropriation for these pieces of work and since a contingent fund of about four million dollars, included in the original appropriation, has not been drawn upon, this prediction seems well founded.

I have just said that the work has been let for less than the appropriation. To show that the contract plans and quantities completely cover the necessary work and have not been purposely reduced, so as to make it appear that the work is being done for less than the appropriation, it may be added that each of the eight



Barge Canal, Contract No. 9.

View showing a portion of completed channel, typical of the Rochester–Lockport level, where in general the alignments of the Barge canal and present canal are identical.

contracts thus far completed has been finished for less than its contract price, the aggregate saving being a sum equal to three per cent of the amount for which these eight contracts were awarded. Moreover, the extra and unspecified work — unforeseen contingencies that in any large undertaking can be provided for only by a margin of safety in the quantities estimated — has been, throughout the progress of construction, just about one per cent of the total value of work done, and, as previously stated, one-third of the project has already been completed.

To appreciate fully the significance of these statements it must be remembered that since construction work began the locks have been widened from 28 to 45 feet, thus allowing the passage of boats of almost twice the original 1,000-ton capacity, and that the canal bottom has been lowered between Niagara river and Lockport and the rock cut at Lockport widened — modifications ordered by legislative amendments, but which have added about four and one-half million dollars to the cost of the canal. It should be remembered also that since the appropriation was made the cost of labor and materials has decidedly increased and that recent legislative acts now require certain increased fixed charges, such as bonds and liability insurance.

Considering these facts, it must be patent to everybody that these results could not have been achieved without the greatest care and watchfulness, for nearly every change of condition since the work began has tended to increase the cost, and the original estimate was never considered excessive. In fact one of the chief contentions of canal opponents was that it was too small.

Surely these are conditions that are unusual in public work. They point toward a completed achievement that will be to the credit both of the State and the officials who have been connected with its building.

TIME OF COMPLETION.

If a rate of progress equal to that attained during the past year is maintained, the Champlain canal throughout its length from Whitehall at the head of Lake Champlain to the Hudson river at Waterford should be ready for operation in a little more than two years — for the opening of navigation in the spring of 1913. By a year later, the spring of 1914, the Oswego canal and that part of the Erie lying east of its junction with the Oswego should be completed, opening navigation from Lake Ontario at the city of Oswego to the Hudson at Troy. In the spring of 1915, or four years hence, the remainder of the Erie should be finished, giving an improved channel from Buffalo to Troy and completing the whole Barge canal system.

HUDSON RIVER CANALIZATION.

I am pleased to report that the Federal Government has made appropriation for canalizing the Hudson river between Troy and the Barge canal terminus at Waterford. This is the work to which I called your special attention a year ago, urging a speedy, determined, united and persistent effort on the part of the Legislature, Congressmen, State officials and all others interested, in an endeavor to obtain this Federal appropriation and to obtain it of the Congress then in session, in order that the work might be finished in time to afford the needed outlet to the Barge canal at its completion. To several people and organizations credit is due for a share in this achievement. Aside from State officials, the chambers of commerce of Albany and Troy are especially to be commended.

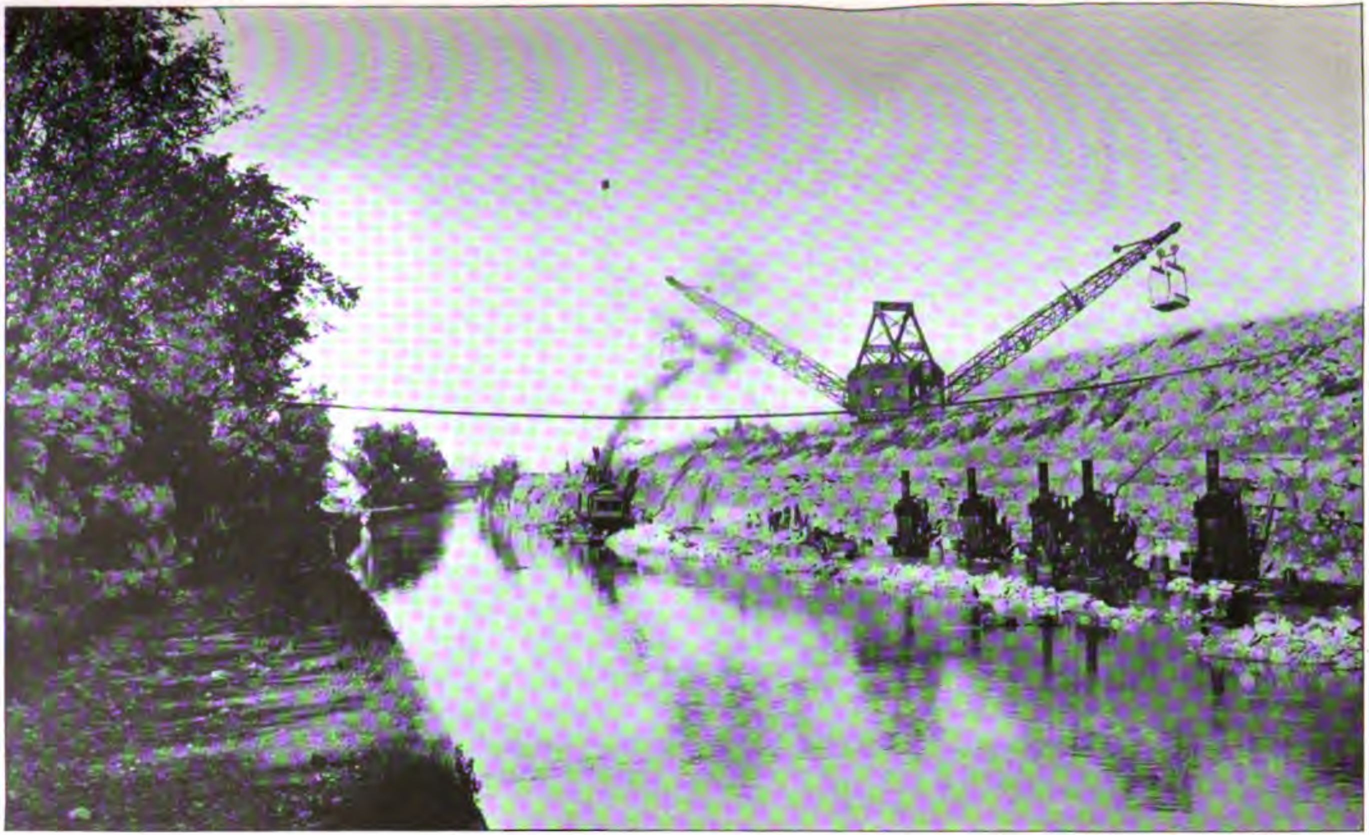
On July 1, as soon as the fund became available, the army engineers, under the direction of Col. W. M. Black, began work on plans for a lock and dam at Troy, and from time to time they have been in conference with this Department, so as to make their plans correspond with ours in general features of construction.

The Government has made provision not only for work between Troy and Waterford, but the project adopted includes improvements down the river as far as needed.

CAYUGA AND SENECA CANAL.

Work has so far progressed on the latest addition to the Barge canal system — the Cayuga and Seneca canal — that at the end of 1910, two pieces of work, involving the construction of a lock and controlling works at Cayuga lake and some seventeen miles of dredging, are under contract.

The reports of the Deputy State Engineer appended to my last annual report and to this report describe the various surveys that



BARGE CANAL, CONTRACT NO. 40.

Double-boom conveyor, steam-shovel and battery of channelers widening rock cut just west of Lockport, down to water surface in the old canal, during season of navigation.

have been made to find the best route. The law authorizing this improvement specifies two general schemes, laying on the canal officials a choice between them.

According to the statute, Cayuga and Seneca lakes might be joined to the Erie branch of the Barge canal by a spur from near the confluence of Seneca and Clyde rivers and running south to Cayuga lake and thence west to Seneca lake, or a separate canal, extending from Seneca lake in a northerly direction and joining the Erie canal in the vicinity of Lyons, might take the place of the channel between the lakes.

After most thorough investigations and careful studies of the whole subject, it has been decided to follow substantially the line of the present canal, which is also largely the natural outlet of the lakes. These examinations involved, along the independent Seneca canal line alone, the consideration of some twelve varying schemes. These included a route by way of Canandaigua outlet, with termini on the south at the east and at the west sides of the foot of Seneca lake and on the north at Lyons and at Creager's bridge; also a route through a chain of small lakes and streams, some two or three miles east of this outlet, and with similar choices of termini. The comparative estimates along these several courses were based on plans for a continuously descending channel from Seneca lake to the Erie canal and also for a summit level midway, with a consequent system of water storage and supply. Along the east and west branch, between the lakes, two general plans were considered. The alternative route, after following the outlet from Seneca lake to a point just west of Waterloo, diverged to the south around the outskirts of Waterloo and Seneca Falls and entered Cayuga lake several miles above its foot, at a point directly east of Seneca Falls.

In view of this early letting of the first contracts and the advanced stage of work on the remaining plans, it seems that this latest branch of the Barge canal system will be ready for navigation as soon as the Erie portion is opened.

THE BRIDGE PROBLEM.

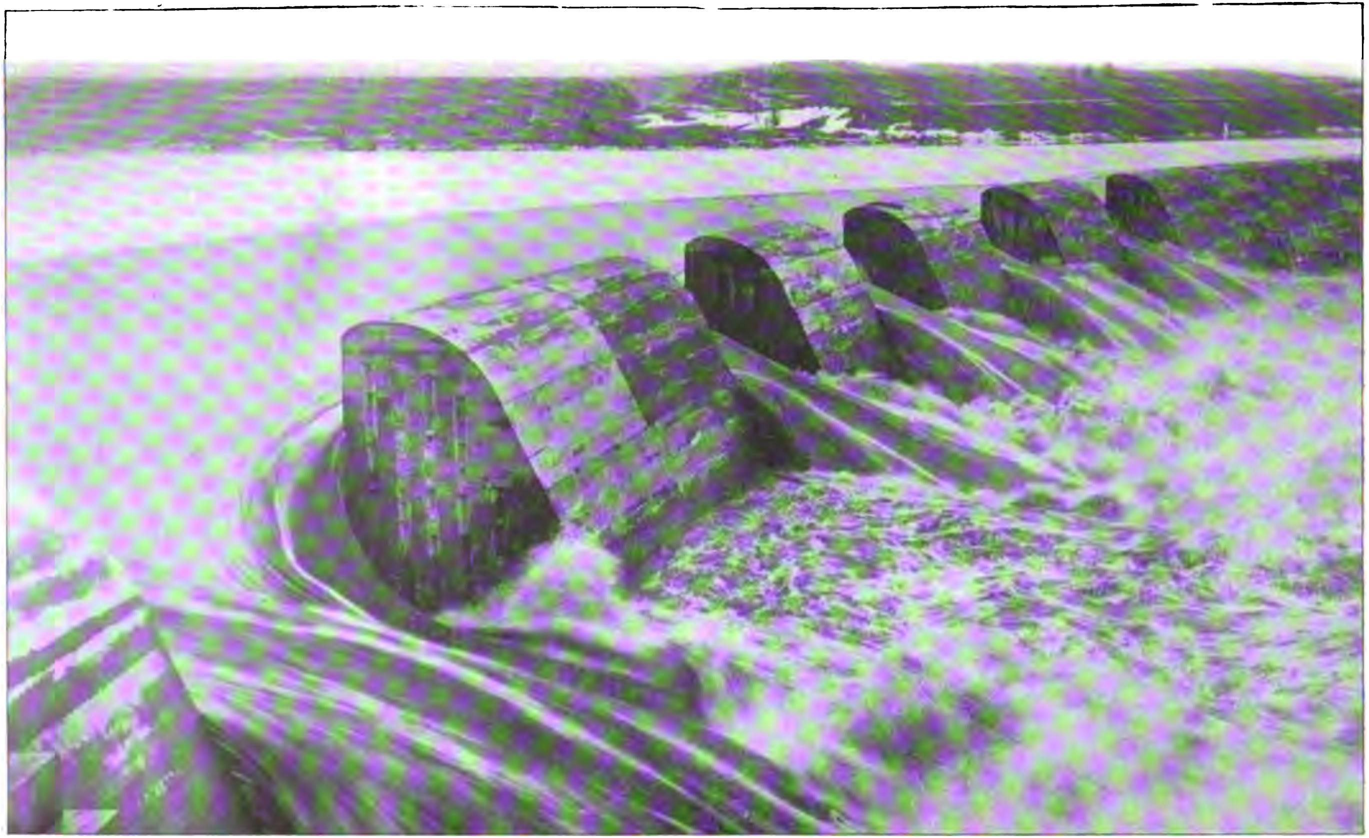
One of the later problems that have arisen in constructing the canal, concerns the style of bridge to be used at certain localities —

whether of the fixed or open variety. In order to provide for the development of a proper terminal at the western extremity of the canal, along Tonawanda creek, the Barge Canal Terminal Commission recommended an amendment to the Barge Canal Law, authorizing a type of bridge that will leave an unobstructed channel for masted vessels, and this amendment became a law at the last legislative session.

The same question arose in relation to the bridges on the Oswego canal, the suggestion coming, however, from some of the business and commercial associations of Syracuse. Through the solicitation of these people a bill was introduced in the Legislature, providing for this change, but making no extra appropriation for the purpose, since its advocates contended that the prospective saving in building the canal was ample for any additional cost incident to such alteration. It is evident that if State officials are true to their trust, they must carefully guard against any attempt to divert any portion of the canal appropriation to other than the originally intended purpose, no matter how desirable the object. Accordingly this measure could not receive the approval of this Department and happily the bill failed of passage. By concurrent resolution of the Legislature this matter was referred to the Barge Canal Terminal Commission. A solution of this problem on the Oswego canal may be had by so building the abutments and so designing certain members of the superstructures that later the bridges may be converted into those of bascule type. This plan, however, has not yet been carried into effect.

NEW TYPES OF STRUCTURES.

During the year three types of structure that have never been built in this country before, have been completed and brought into use. The first of these to be finished was the siphon lock at Oswego, which was ready for use on May 28 and has been in operation since then throughout the season. This structure is of interest not only because it is the first siphon lock to be built on this side of the Atlantic, but also because it is the largest lock to which the siphon principle has up to the present time been applied. The working has been very satisfactory. The chamber can be filled in from 4½ to 5 minutes and emptied in a slightly



Barge Canal. Contract No. 14.

View of eastern portion of Crescent dam, with completed alternate sections, during spring flood.

longer time. The water is set in motion by using the difference of head to create a vacuum in a storage tank in each wall, thus starting the process of filling or emptying, which afterwards completes itself automatically and also automatically restores the vacuum in the tank, so that all is ready for the next operation. No large culvert-valves with their machinery are used as in the other locks, but the movement of the water is controlled by two four-inch valves at each end of the two lock walls.

A spectator observing this lock in use would doubtless be impressed to see how evenly and quietly the lock chamber is filled. After the lock-tender has turned a small valve and the air carried by the starting water has begun to find its vent through a pipe in the wall, the only indications of the inrushing stream are the bubbles rising first opposite the upper port holes and then in turn at each successive port to the foot of the lock. These finally disappear, leaving no indication of the flow, except occasional signs of movement on the surface. The operation of this lock during the year in connection with navigation on the present Oswego canal demonstrated that, with culverts and outlets in the side walls, such as are being used for all the locks on the Barge canal, there is so little unequal movement of the water that, after a boat has been tied, its lines need practically no further attention. The tendency to drive along the chamber, noticeable with all locks which fill through the lock-gates or from one end only, is almost entirely eliminated and the movement of the water is so steady that the boats remain almost stationary.

This lock at Oswego has worked so satisfactorily that two siphon locks are being planned for the Cayuga and Seneca canal.

A second of these new types of structure also uses the siphon principle, applying it to dispose of surplus waters — an office usually performed by a waste-weir or spillway. Hence the name of this new structure — siphon spillway. Three of these were planned for the Champlain canal and two of them are now in successful operation.

A widely fluctuating canal water-surface is to be avoided, if possible. Accordingly it is necessary to get rid of any surplus, but if this water, intercepted by the canal from its natural outlet, may at times flow in rapidly, it must be discharged with equal rapidity. Ordinarily this has been accomplished by a waste-weir with sufficient length of spillway to pass the required amount in the given time. However, when the volume is large, the spillway must be long, and sometimes conditions exist which make a long spillway undesirable or even impossible. The presence of such conditions, especially in the case of one of these three structures, has led to the designing and introduction of this new structure, a type which will perform the same amount of work as an ordinary spillway, but with a decided reduction in length, the ratio varying from one to three to one to five at these particular spillways, depending, of course, on the available head of water, while at the same time the economy in cost of construction is considerable.

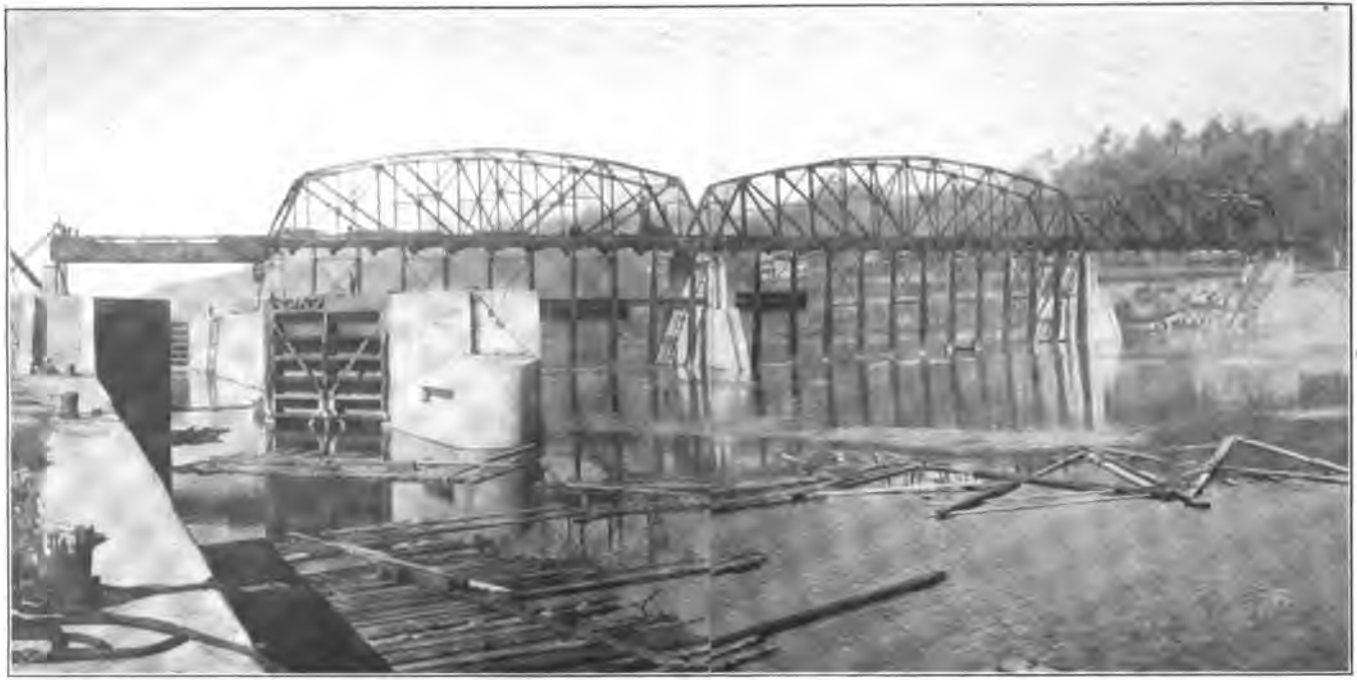
The siphon action in these spillways is entirely automatic, both in the starting and stopping of the flow, and this automatic feature, dispensing with attendance, is especially advantageous. It is believed that in these structures the siphon principle is used for the first time to create a spillway of any considerable size.

The third instance of novel types is found in the movable bridge dams which have been in course of construction on the lower Mohawk for a year or two. Some of these are now nearly completed, but the gates are being left for the winter in a horizontal position under the bridge floor, ready for use, however, after the spring floods have passed and the dredges need pools in which to float and excavate the channel of the improved waterway.

As these structures have been described in former annual reports, no additional account is needed here. Next spring, when these dams are placed in operation, holding back the waters, many thousands of the state's citizens who never read department reports will doubtless be interested in these first movable dams of bridge type to be built in this country.

CANAL TERMINAL COMMISSION.

Since my last annual report, the Barge Canal Terminal Commission, created by the Legislature of 1909, was authorized by legislative act to continue its investigations and was given an appropriation to enable its members by personal inspection to



BARGE CANAL, CONTRACT NO. 8.

View showing progress on the movable dam at Cranesville. The upright gate frames are seen suspended beneath two bridge spans and a part of one tier of gates is shown.

include the terminal facilities of European countries among their studies.

The subject of proper terminals is so vitally connected with the success of the enlarged canal that the State might well have spent a much larger sum on these examinations, thus enabling the Commission to make suitable surveys and plans. The study of European practice was also wise. Although, as Americans, we may regret that Continental Europe is ahead of us in respect to terminals for canal-borne traffic, the only sensible course is to acknowledge the fact and try to benefit by the examples we may find.

The commissioners, appreciating the importance of this subject, have given to it their careful and diligent attention. Their report, now in preparation, will be presented at the coming session of the Legislature.

RECOMMENDATIONS.

In my report of last year I called your attention to several matters that needed legislative action. Such recommendations as failed of favorable consideration I shall repeat, since not only are the needs still as pressing, but a year's delay has made haste more imperative. I shall also add some new recommendation.

Maintenance of Completed Canal.

As I said a year ago, an appropriation is needed to maintain such portions of the Barge canal as have been completed, but will not form a part of the channel used for navigation till adjacent sections or the whole length are finished. It is not possible to complete each part just prior to the final opening to navigation, and consequently some portions must be subject to deterioration. To allow such impairment to continue until the cost of restoration should become large, would be folly. Accordingly I recommend an appropriation for this purpose.

Such sections of the new channel as at once become a part of the navigable canal will be maintained from the fund regularly provided, but the completed portion not falling within this class is already of considerable length and is constantly growing longer.

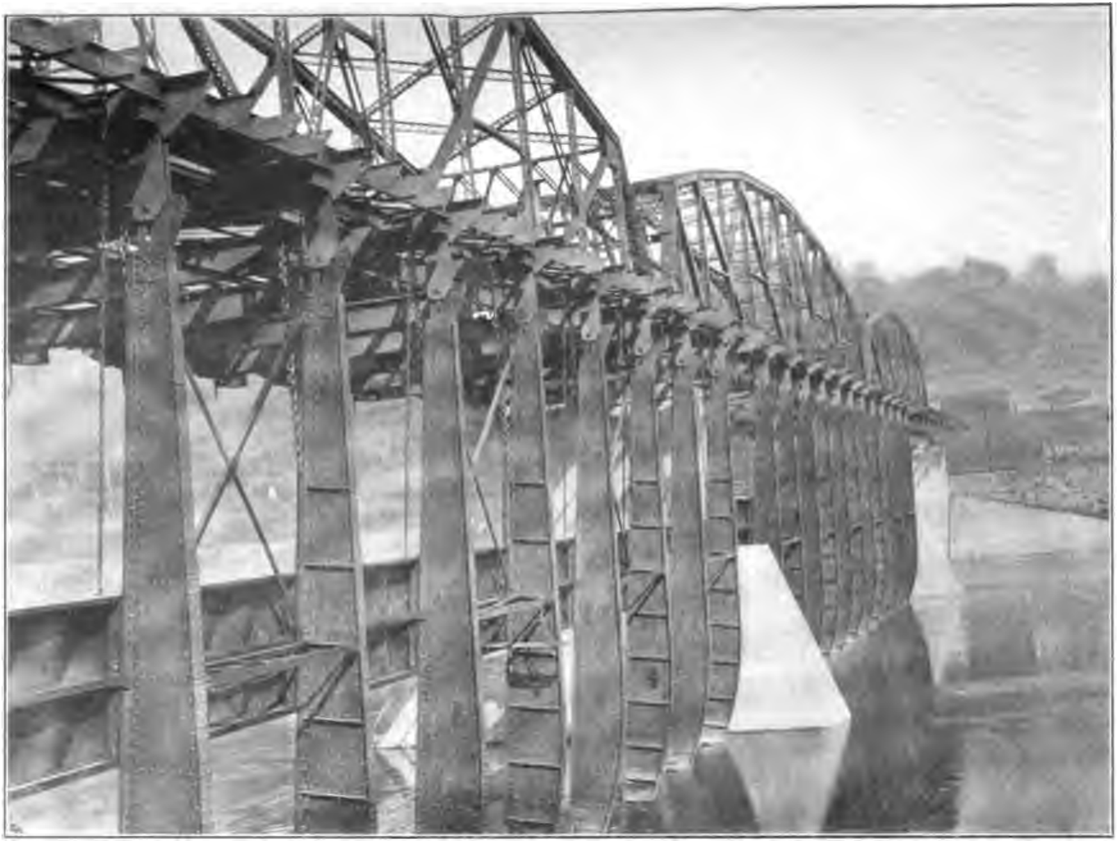
Charting of Canalized Rivers and Lakes.

A year ago I told you of the necessity of speedily charting the rivers and lakes that are being canalized in constructing the Barge canal and also of making provision for the printing and sale of the completed charts. A bill authorizing this work failed to become a law. After a year's delay, the need of haste in beginning this work is still more apparent.

When the Barge canal is completed, much of its channel will lie, not like the present canal, confined between earthen embankments, but somewhere in the broad expanse of river or lake surface. It must be evident to all that under these new conditions it will be dangerous for boatmen to attempt to navigate the canal without suitable charts, and the need for haste is appreciated when it is understood that at certain places canal traffic must very shortly be turned into the river channels, so as to expedite construction at other places.

It is probable that many vessels using the new State canal system will also navigate the waters of the Great Lakes, the St. Lawrence river, Lake Champlain and the Hudson river, and to a certain extent that the coastwise traffic along the Atlantic coast will pass through the State canals. Accordingly it seems best that the charts made for the Barge canal should be similar in form to those in use by the United States and Canadian governments. The United States maintains a lake survey department for surveying and charting the northern and northwestern lakes and their connecting rivers and harbors, and this department has standardized a chart which shows in colors the various depths of the waters navigated. This chart has become so popular among navigators of the Great Lakes that the Canadian Government has adopted similar colors for its charts, while the United States Navy Department has done the same in its Mercator charts of the Great Lakes.

As the State of New York is not so well equipped for this kind of work as the United States, which has a complete equipment and organization, it seems desirable to solicit the aid of the Federal Government in charting the waters of the Barge canal system. It is believed that if the needs and claims of the State are properly presented to Congress, the surveying of the northern and north-



Barge Canal, Contract No. 8.

Near-by view of the movable dam at Cranesville, showing details of construction.

western lakes may be extended to include the improved waters of our canal system.

To this end I recommend that both branches of the State Legislature formally petition the Congress of the United States to undertake this work and that our members of Congress be urged severally to use their best endeavors to obtain favorable action and to obtain it without delay.

Incidental Water-Power Development.

In building dams to canalize the rivers of the Barge canal system, valuable water-powers have been or will be created in the near future. The value of these developments amounts to several million dollars and, as the State's money has created this value, it is important that this energy should not be wasted and that the State should receive whatever income may accrue from its expenditure. Private interests have been and are now reaching out to take these valuable resources from the State. While I believe that better results will probably be obtained by arranging for the completion of these developments by private rather than by public capital, this should not necessitate any sacrifice on the part of the State of any of its interest. If suitable contracts for such developments based on a return to the State of a fair value for what it is giving cannot be made, then I would by all means favor public development. There is no reason why the State cannot find a market for electrical power.

I have recommended and I renew the recommendation that the State retain the fee interest in all these properties and that any contracts made for their disposition be based on leases of twenty to thirty years with power of renewal for an additional term.

With proper legislative restrictions, safeguarding the navigation interests of the State, the making of such contracts is in my judgment advisable and I recommend the subject to your earnest consideration.

However, since certain questions involved in these power developments, including that of precise control at some places, can be settled only by judicial decision, the experience of the past year leads me to urge most strongly that no portion of these water-powers be disposed of until the Legislature shall have caused very careful and thorough investigations to be made and shall be in possession of sufficient information to enable it to enact comprehensive and uniform legislation. The progress which certain litigation involving some of the questions referred to has made, leads me to hope that your deliberations on this subject may shortly be aided by a judicial clarification of an exceedingly complicated situation.

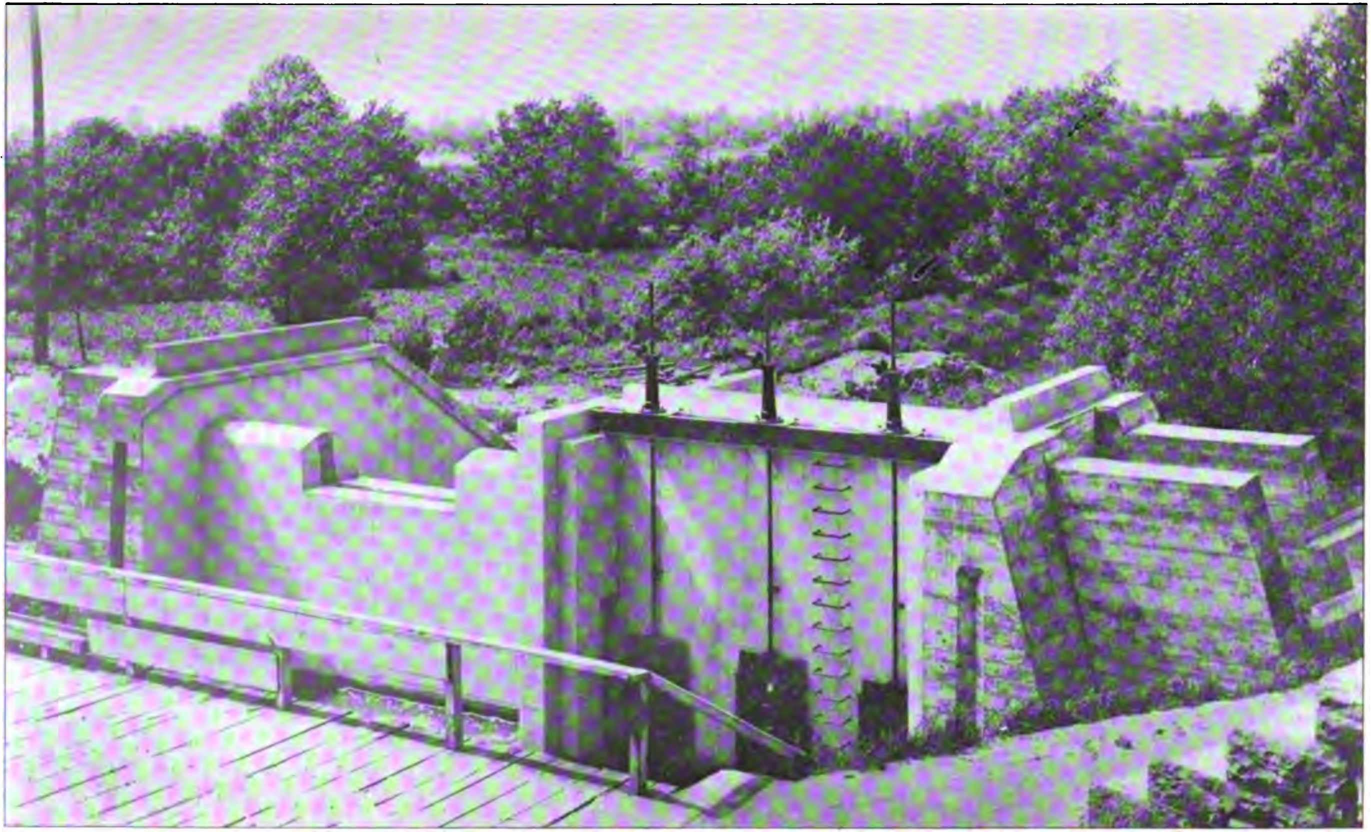
Boats for the Barge Canal.

A very important factor in the successful use of the completed canal is the type of boat to be employed. Thus far this subject has received very little consideration from anybody, but it is important, nevertheless.

With all the improvements that are being made to the canal itself, it should no longer be true that the typical New York State canal boat represents probably the only factor in transportation that in model, construction and motive power remains unimproved since the days of our grandfathers. As a member of the Advisory Board of Consulting Engineers said in a paper before the Providence Convention of the Atlantic Deeper Waterways Association, "unlike the old Erie, the new system infers a wholesome type of vessel;" and he added, "Looking today at the square-ended Erie canal boxes, miscalled 'boats,' dragged usually by three decrepit horses at a speed of about two miles an hour, one marvels, not that the traffic on the Erie has diminished, but that it remains at over 3,000,000 tons annually."

Surely it is high time for the State to awake to its responsibility. From the beginning of our canals it has been left to boatbuilders to construct and navigate boats of whatever design they chose, so long as they did not injure the canal. Once — in 1871 — the Legislature tried to better conditions, not, however, in the way of boat design, but in the encouragement of steam propulsion. It named a commission to examine inventions, and appropriated $100,000 to be given as prizes for propelling devices that should meet certain requirements. This stands as the one conspicuous instance of State aid.

Europe led us by a decade or two in modernizing her canals, and now we are following. We should also adopt better boats, as she has done, even the smaller canals, notably those of France,



Barge Canal, Contract No. 61.

View of Brockport waste-weir, during construction.

Belgium, Germany and Austro-Hungary showing barges of excellent model.

It seems desirable that the State should exercise more authority over the type of boat to be allowed on its canals, but before this can be done, it should be in possession of accurate knowledge as to the best types for various purposes and should be able to direct boat-builders in general along the lines to be followed. Accordingly I recommend that the State Engineer be given authority and, if need be, an appropriation, to make a thorough and careful study of this whole subject.

Amendment Concerning Bridges Over Navigable Streams.

In the vicinity of Cross lake the line of the Barge canal, which there occupies the bed of the Seneca river, is crossed by the Lehigh Valley railroad. The railroad company, upon being ordered to proceed at their own expense to make their bridge conform to the new conditions incident on canal construction, brought action against the Canal Board. The case was heard and decision rendered against the State — not because the Seneca river is not a navigable stream, for the State's contention that this river is a navigable stream and the property of the people of the State was sustained, but on the ground that the Barge Canal Law does not distinctly declare an intent to place the cost of such bridges on the person or corporation crossing these streams with structures.

This case has been appealed and it is hoped that decision will be reversed, but in view of the large number of similar cases that are liable to arise, and since heavy expenditures depend on the decisions, there should be no ambiguity in the wording of the law. I believe it was the intent of the framers of the law to relieve the State of the cost of rebuilding railroad bridges across navigable streams. Therefore I commend to your careful but expeditious consideration the advisability of amending section 5-a of the Barge Canal Act.

Municipal Parks.

A year ago I commended to your attention a matter that involves no expense to the State, but which, if carried out, would give esthetic value to certain portions of the canal and to nearby cities and villages, and would add greatly to the pleasure of many of our citizens. I refer to the making of provision to allow municipalities to convert into parks spoil areas in their vicinities. If legislative sanction were given to the transfer of these parcels of land upon payment to the State of the mere cost of acquiring them, reserving a right simply to reënter for canal purposes, doubtless some of the municipalities would avail themselves of the opportunity.

Tree Planting on Spoil Banks.

Certain of the spoil banks made in digging the canal are not suitable for cultivation — notably those along the sandy stretch just east of Oneida lake, known as Contract No. 4 — and on such areas I recommend that the State take steps to plant suitable trees. Aside from the fact that they may add something to the beauty of the landscape, they will serve a very useful purpose in giving stability to shifting sands, in utilizing otherwise waste lands and ultimately in adding a little to the State forests.

TESTING LABORATORY FOR STATE WORKS.

For many years the State Engineer's Department has included a testing laboratory where are made tests of all hydraulic cement used for State work, not only for the numerous works which are under the direction of the State Engineer, but also for those supervised by the State Architect, in the many buildings which he constructs. The character and importance of the work being done on the Barge canal has also necessitated the testing of sand submitted for use in the large concrete structures. The testing of cement for State highway improvement is still carried on in this laboratory, though at the expense of the Highway Department.

The methods of cement testing are in accord with the latest and best practice and insure the use of none but the best cements for State work. The high grade of requirements has been maintained during the year, thus keeping up with the improved methods and products of American manufacturers of Portland cement.

Cement proposed for use in large quantities on the Barge canal is now generally sampled at the cement mill and this has become a very important branch of the work of the laboratory.

The detailed account of the year's work will be found in the appended report of the Resident Engineer in charge of the laboratory.

COURT OF CLAIMS SURVEYS.

For years it has been the practice for engineers of this Department to make surveys and present evidence on behalf of the State in cases that come before the Court of Claims in their hearing of claims for damages alleged to have been caused by State public works, especially the canals and their adjuncts. This evidence is usually a large factor in the case and has saved much money to the State in disproving unjust and excessive damages.

In this connection it is interesting to note that out of a total of $4,955,715 of claims, other than for land appropriations, filed on account of the Barge canal improvement, which have been passed upon by the courts, the amount of award was but $418,525, or 8.4 per cent of the amount claimed.

This Court is now almost exclusively engaged in disposing of Barge canal claims, and the preparation of expert evidence for these cases devolves upon the engineers of this Department. This includes the gathering of much data and the ability of these engineers to qualify as experts in their respective branches of the profession.

Probably the most important questions involved in much of this litigation are those of a hydraulic character, and for a full understanding of these the records which the State Engineer's Department has been accumulating for several years are of inestimable value.

A complete photographic record of lands and buildings appropriated has been made by men connected with this Department and these views also furnish valuable evidence before the Court.

Accounts of the work done for the Court of Claims will be found in the appended reports of the Division Engineers.

The amount of work done in making these surveys and preparing this evidence is large and constantly increasing. Therefore I recommend an appropriation at least equal to that of last year, namely, $5,000.

BUREAU OF BRIDGES.

In 1899 a Bureau of Bridges was established by law in the State Engineer's Department. As the needs prompting such action and the benefits following its creation have been set forth in former annual reports, they need not be repeated here.

Since the beginning of Barge canal work, this Bureau has become a necessary part of that enterprise — in designing not only the bridges but also the lock-gates, lock-valves, needle-dams, movable dams and other steel construction.

The bridges over existing canals in the state often call for expert inspection and this is performed by the Bureau of Bridges upon request from the Superintendent of Public Works. If repairs are necessary, plans also are furnished by the Bureau.

In addition, the Bureau has the duty of examining plans submitted by electric and steam railway companies for new bridges over the canals, or for strengthening existing bridges.

LAND BUREAU.

The Land Bureau of the State Engineer's Department has charge of the sale of State land and of the custody and care of ancient records. The ancient records of this Department, as well as the modern ones, are of great value for reference, and it has been the policy through recent years to add to them whenever this can be done without cost to the State.

A year ago I recommended that sufficient appropriation be made to allow the Bureau to keep up to date the maps showing lands under water, so that at all times it may be possible to ascertain just what has been granted, and also that the State Engineer may not be obliged, as at present, to accept as accurate the maps and reports of engineers in private practice, when application is made for the granting of lands.

As such provision was not made, I repeat my recommendation for an appropriation, both for keeping the maps up to date and for making surveys, when necessary.

In each of the last two annual reports your attention has been directed to a condition that exists in connection with the sale of State lands at public auction that calls for remedial legislative action. As has been stated in these earlier reports, the State Engineer is intrusted by the Commissioners of the Land Office with the public sale by auction of State lands, including those acquired for unpaid taxes. At these sales men have sometimes been in attendance, seemingly for the purpose of blackmail only, who have extorted money from the former owners by threatening to run up the bids, or have compelled them to pay much more than the unpaid taxes by carrying out their threats.

It has been suggested previously that this objectionable practice might be stopped by amending the statute which defines the duties of the Commissioners of the Land Office (chapter 317, Laws of 1894), by extending the privilege of redemption up to the time of the public sale, or permitting the prior owner upon application to purchase the property at private sale for an amount which should cover the total expense to the State for such property, including unpaid taxes, interest and costs.

Since, under the present law, the State Engineer is powerless to prevent occurrences of this character, there will exist a condition that will be a menace to a just execution of the law until remedial action is applied. Therefore I repeat my recommendation of a year ago, that chapter 317, Laws of 1894, be suitably amended.

The detailed report of the engineer in charge of the Land Bureau will be found appended to this report.

BUREAU OF HYDRAULICS.

In 1906 a Bureau of Hydraulics was established in connection with the Barge canal. This Bureau has supervision of certain classes of hydraulic and hydrographic work, as shown under the following general heads:

(1) Study of general problems in relation to the hydraulics and hydrology of the rivers and canals, arising in connection with both the design and the construction of the Barge canal. This feature of the work has included important studies of river and canal slopes, the compiling of data and making of studies to determine high navigable and low navigable stages, the determination of the flood flow of streams, the determination of water-supply required for lockage, for power and other purposes, and questions as to the feasible utilization of water-power created in constructing the Barge canal.

(2) Maintenance of gaging stations in connection with the Barge canal. About 100 gages are maintained and regular readings are taken — usually twice each day — for the purpose of determining water levels along the line of the canal. These

gagings are used for various purposes — in designing the canal, by contractors in providing coffer-dams and protecting their work against floods, and for other purposes — and are intended to form ultimately a basis of comparison between the water level in the streams in their natural condition and the water levels of the canalized rivers. In addition about 25 gaging stations are maintained where the discharge is estimated, the object of these being to determine the flow of the canalized rivers, their principal tributaries and the streams used as canal feeders.

(3) The Bureau of Hydraulics has general charge of the preparation of the technical defense by the State in claims arising from the appropriation of water-power, from backwater caused by Barge canal dams, and in other similar hydraulic claims. This is the most important work of the Bureau and is of such character as to be absolutely indispensable to a successful refutation of many unjust and excessive claims brought against the State.

An appended report from the engineer in charge of this Bureau enumerates the cases for which defense has been prepared and also contains the data collected in the gaging of streams.

STATE BOUNDARY LINES.

One of the duties of the State Engineer, as prescribed by law, is to examine, survey and monument state boundary lines. The total length of these state boundaries is 1,416 miles, comprised as follows: Canadian line, 431 miles; Vermont line, 171 miles; Massachusetts line, 50½ miles; Connecticut line to Long Island sound, 81 miles; along the ocean around Long Island to the New Jersey shore, 246 miles; New Jersey line, 92½ miles; Pennsylvania line, 344 miles to the beginning of the Canadian line in the middle of Lake Erie. The boundaries are fixed by accepted agreements and are marked by natural watercourses or by monuments.

The examinations of state boundary lines, made within the last half dozen years by men connected with this Department, have shown all of them to be in a fairly satisfactory condition, except the one along the Connecticut boundary. A half century ago this line was established and monumented by New York State commissioners, but was not accepted by Connecticut until twenty years later. Evidently the New York commissioners considered their work as of a more or less temporary character, for some of the monuments were but roughly hewn granite or marble slabs, while others were nothing more than inch-square iron pins, projecting some six inches out of the rock. For a long time these monuments have been in a very unsatisfactory condition, some of them having entirely disappeared. A boundary line thus inadequately marked gave rise to many disputes and was a disgrace to both States. Realizing this, for several years the State Engineers of New York tried to secure the coöperation of Connecticut officials in remonumenting the line, but without success, till the summer of 1908. At that time no appropriation for this particular boundary was available, but the State Engineer, deeming it important to accept the overtures of Connecticut, decided to use what remained of a fund for general boundary line examinations for starting the work. In 1909 a special appropriation was secured and the work continued, but the fund was not sufficient for finishing operations and a second amount was obtained in 1910, under which the undertaking has been pushed to final completion.

A report of progress was appended to my report of last year. A detailed account of what has been accomplished since that time is attached to this report.

The law (chapter 678 of the laws of 1892) which lays upon the State Engineer the duty of examining these boundaries directs him to make an examination every three years of all of the monuments marking the boundary line of the state, and if any monuments are found injured, missing, or displaced, he is authorized — acting in conjunction with the duly recognized authorities of the adjoining State — to replace such monuments. To carry out the provisions of this law, an appropriation is needed.

BLUE LINE SURVEY.

In my last annual report I recommended that appropriation be made for retracing and mapping the boundaries of State lands along the canals that are now being improved, inasmuch as the present operations are likely to obliterate determining marks for their reëstablishment. In response to my suggestions you made appropriation to begin this work, and most wisely, it seems to me, for the need was very urgent. When it is realized that never, until the beginning of Barge canal operations, have State canal property lines been suitably monumented and that in many places no map since that of 1834 may be relied upon as authorative in courts of laws, the importance of the work is appreciated. When it is further realized that the State lands within these bounds have become very valuable in many localities and that much valuable adjacent property depends on these same lines for description or starting point, and that an alteration or destruction of existing canal banks and structures, before the "blue line" should be rerun, would doubtless result in endless litigation and probable loss to the State, the necessity for continuing this work to the end will be seen.

Since the appropriation became available, researches and field surveys have been in progress, with satisfactory results. It was to be expected that many tangled problems would be encountered, but thorough investigations and pains-taking care are solving them. The appropriation made last year will not be sufficient to complete the work throughout the state, but there should be no delay in making provision for additional funds, as soon as they are needed.

A detailed report of what has been accomplished will be found appended to my report.

CO-OPERATIVE SURVEY OF STATE.

Survey of New York State in Coöperation with the United States Geological Survey.

TOPOGRAPHIC SURVEY.

A year ago I laid before you a matter which I deemed of sufficient importance to warrant the expenditure of $25,000 in each of three years, so as to bring it to a successful completion. Since the sum granted was less than half the amount recommended, I feel called upon again to declare the value of the work and to show the need of hastening its completion. I refer to the topographic survey and maps which this State has been making of its territory, in coöperation with the United States government, since 1893.

When I state that, without doubt, this is the most complete and useful general map ever made of the state, that it is being secured at less than half its actual and very moderate cost (the expense to the State being less than $6 per square mile) and that already its cost to the State has been more than offset by amounts saved to State departments and municipal governments, then its importance may be partially appreciated.

It is well that this work was begun as early as it was, since the maps already finished have been of much value in the large amount of public improvements planned or undertaken in the last two decades. Within this period there have come a canal enlargement and its necessary water-storage, a system of State highways, a largely increased forest reservation, a state-wide investigation of water-supply and power development, a great metropolitan water-supply system, an increased State-control of sanitation, a network of trolley lines and numerous municipal water-supplies and private power developments. In all of these enterprises the engineers have made much use of these United States Geological Survey maps.

The agreement between the Federal and State governments divides the expense of surveying equally between each, but the cost of engraving and printing the maps is borne by the United States alone. For convenience the state was divided into 260 quadrangles, a separate map being made for each. As the maps for this state are generally drawn to a scale of about one inch to the mile, each quadrangle is on a sheet of 20 x 16½ inches in size. These maps are sold to the public, the price being nominal — five cents apiece in lots of less than a hundred and three cents each in quantities of one hundred or more.

Last year I informed you that the survey in this state is nearing completion, it being estimated that if New York should appropriate $25,000 annually for three years, and if the Federal Government should set aside a like amount, all operations could be finished in that time. I said also that one of our United State Senators had given assurance that he would urge our claims for this increased Government apportionment, if the State should make its appropriation.

Up to 1905 it had been customary for New York to spend $30,000 annually on this work. The failure of the State to make any appropriation whatever in that year resulted in transferring our usual Federal share to work in other states. At the recent slow rate of progress some eight or ten years will be required to finish the small remaining portion. It would seem a much wiser policy to make adequate provision for the speedy completion of the whole undertaking, before greater demands on the National Government from other localities still further delay operations here, and in order that we may the sooner secure the full benefit of the finished surveys. Accordingly I recommend the appropriation of at least $25,000.

HYDROGRAPHIC SURVEY.

Beginning with the year 1900 a certain amount of stream gaging has been done under a coöperative agreement between New York State and the United States Geological Survey. With the exception of the year 1905 there has been an annual appropriation of $1,500 by the State for this purpose. The work is done by the Geological Survey under the general supervision of the State Engineer. The Bureau of Hydraulics of the Barge canal department has the immediate supervision of this work. The coöperative fund is insufficient to provide for all of the gagings required in connection with the Barge canal work and is chiefly used in maintaining important gaging stations on certain streams not directly parallel to the canal, whereas the gagings of the Mohawk and Hudson rivers and other streams used as feeders for canals are maintained in connection with the Barge canal work directly. I recommend that the annual appropriation be continued.

RECONNAISSANCE OF NAVIGABLE STREAMS.

Concerning the streams of New York state, which, because of actual usage from early times or by legislative act, or both, have become navigable public highways, I desire again to speak.

A manifestation of public demand for waterway improvement has for several years been sweeping over this country, but, as a people, we are just beginning to learn that "what we need in the United States in the way of river improvement," to quote the recent words of Brig.-Gen. W. H. Bixby, Chief of Engineers, U. S. A., "is not so much increased width or depth of existing rivers as to have those rivers thoroughly clear from their own natural obstructions, such as rocks, snags, fallen timber and river bars, so that their existing depth can be fully utilized by any boats able to reach them."

I feel that a better understanding of our navigable streams and a possible greater utilization of these waterways is so important a subject that I must repeat what I said last year and reiterate the recommendation which I made at that time.

It is doubtful if there is any general realization of the number and extent of these streams over which the State is sovereign and retains control for navigation purposes. The development of this extensive system has been gradual and has been carried on in piece-meal fashion.

The navigable streams of the Hudson river basin include not only the Hudson river itself, but a number of its important tributaries, as, for example, the Schroon river, the Mohawk and the Wallkill. In the Delaware river basin, the east and west branches of the Delaware river and the Beaverkill are public highways; in the Susquehanna river basin, the Susquehanna, Chenango, Chemung, Canisteo and Tioga rivers and smaller streams; in the Genesee river basin, the Genesee river, Black creek, Oatka creek and Canaseraga creek. So also in the Allegheny river basin the principal streams are public highways, as is also the case of the Black river, the Oswegatchie river, portions of the Grasse, Racquette, St. Regis and Salmon rivers, the Saranac river, Lake Champlain and Wood creek. So also is the entire system of Central or Finger lakes, with their outlets and most of their tributaries. Numerous other rivers and streams in the state, which I need not name, will also be found to be included in this list, making a grand total of 1,800 miles.

In many instances more or less public money has been expended at one time or another to improve navigation, but as a rule, except on streams forming part of the present canal system, there is no State official or department having general or official charge of these numerous waterways. It would seem appropriate at this time to take steps looking both toward a better understanding of the navigable waterways of the state and also toward the inspection, protection and better utilization of these waterways, which are the properties of the State.

Under present conditions there is a strong tendency toward the usurpation of the streams of the state for private purposes, including power development, water-supplies and the like. These objects, while eminently worthy, should never be permitted to interfere with the preëminent right of the State for purposes of navigation. Without doubt the State has frequently been compelled to pay for rights previously purchased or never having legally passed from its possession, for the term "vested rights" has become one to juggle with by claimants for damages and the State has suffered through a lack of accurate information concerning the rightful possession of its waterways.

Therefore, I recommend, in order that intelligent progress may be made in the development of additional waterways and before other rights are usurped or existing usurpations are strengthened through lapse of time, that proper legislative provision be made for instituting a broad investigation of the whole subject, which should include:

(1) A compilation of the history of all important navigable streams.

(2) A general engineering reconnaissance, to determine the characteristics of the streams and the steps, if any, which may best be taken, looking toward their development, together with a study of the probable utility of greater navigation facilities.

SURVEYS FOR STATE COMMISSIONS AND DEPARTMENTS.

A year ago I recommended the enactment of some statutory provision that should direct the State Engineer to make all necessary surveys for State departments and commissions which have no engineering corps of their own. It is the custom of many years' growth for the State Engineer to make such surveys upon the request of the departments needing them, such department paying the actual costs, but there is no law to govern this action.

As I said last year, the nature of the State Engineer's duties makes him the logical and proper official to have charge of these surveys, and in fact work of such character constitutes one of the reasons for the existence of his office. Also, as I further stated, he can generally make them more economically and more speedily than can engineers in private practice, since they are compelled to form an organization for the special purpose, while he has a large force already well organized. As a specific instance in substantiation of this statement, I noted a survey for which the Lunacy Commission received bids from private engineers before it was placed in the hands of the State Engineer. It developed that the cost for doing this particular work was but two-thirds of the lowest bid, while it was one-seventeenth of the highest and one-fifth of the average of the several bids.

During the past year seven surveys of this character have been made — three for the State Architect, two for the State Prison Commission, one for the State Armory Commission and one for the managers of the House of Refuge at Albion.

A statement of one of my Division Engineers in his report of making these surveys emphasizes a further recommendation that I made a year ago and which I desire to repeat. After explaining that, although the cost is borne by the department for which the work is done, it often happens that the money is not available as soon as the survey is needed, he says: "In such cases, to avoid delays, the Division Engineer has been accustomed to advance the money to pay the men, but sometimes this has proved an injustice to other men in the Department by compelling them to wait for their salaries until a succeeding month's allowance can be obtained from the State Treasury."

To obviate this difficulty, I recommended that a fund of at least $5,000 should be placed in the hands of the State Comptroller, which might be drawn upon temporarily to carry on these surveys — to be refunded later by the department or commission for which the survey is made.

Again I commend to your consideration and urge suitable action on both of these subjects — statutory provision directing the State Engineer to assume these duties which naturally belong to him, and a loan fund for the purpose I have stated.

FIRE-PROOF DEPOSITORIES FOR RECORDS.

In my former report I told you of the need of fire-proof depositories for the valuable maps and records on file in the several offices of the State Engineer's Department. Before my report could reach you, there occurred a fire in one of the residency offices, which lent timely emphasis to my words. Fortunately, in this instance, the engineers were able to remove nearly everything of value in time to save it. But it is not wise to take such chances. Of the great value of some of the records there can be no doubt, especially as evidence in litigation and as data to determine state lands and to fix state and county boundary lines. The impossibility of replacing the records, if once destroyed, is equally evident.

At the last legislative session a fund was granted for making changes in the weigh-lock building at Syracuse — the office of the Middle Division Engineer,— but there is still urgent need for adequate provision at Albany and Rochester, and accordingly I again commend this subject to your careful consideration.

RELICS OF EARLY NAVIGATION.

A year ago I called your attention to a small work of restoration that is needed if certain historic relics at Little Falls are to be kept from falling into ruin. As a patriotic duty I considered it my task to obtain funds for this work, since the Legislature of 1883 made the State Engineer a member of a commission to preserve and dedicate these relics to public use. The structures I refer to — a canal lock and a stone arch bridge — were built more than a century ago by a company chartered by the state in 1792 to open navigation to the interior of our commonwealth. Except a few depressions marking the old channel, these structures are all that remain of the first attempt at internal improvements. They stand as monuments — relics of the early years of our Independence and of that material means which, equally with or perhaps above any other, brought prosperity to the young nation. During all the changes of time and circumstance these structures have been remarkably well preserved, up to three or four years ago, but now one lock wall has begun to fall down. A very little work, however, will restore it.

In response to my suggestion, a bill embodying my ideas was introduced at the last legislative session, but there developed an opposition, prompted by local business interests, and a substitute proposition was offered, proposing to remove and rebuild these structures at an entirely new location — somewhere on the river flats above the city.

I do not approve of the relocation of these works, but I do most heartily urge a small fund for their restoration, as it seems a duty to future generations, if not to ourselves, to protect such important reminders of our early history.

CONCLUSION.

Appended to this report there are tables giving the engineering expenses for the fiscal year, other tables showing all contracts that have been in force, a detailed report from each of the three Division Engineers, reports of the work of several bureaus, of bounary line surveys, of the coöperative topographic survey of the state, and the data secured in gaging the flow of streams.

As my chief assistants to help me carry on the work of the Department, I have had Mr. Harry W. DeGraff, who has served as Deputy State Engineer, and Mr. William B. Landreth, who has held the position of Special Deputy State Engineer, the latter having had direct charge of nearly all Barge canal operations, while the former has supervised work other than Barge canal construction and also the preliminary stages of the Cayuga and Seneca canal enlargement.

Thomas W. Barrally, Guy Moulton and George D. Williams have held the important positions of Division Engineers and have had direct charge of the Barge canal construction work carried on in their respective divisions.

Each of the five men who served as my executive officers had had experience in Barge canal construction covering several years prior to their appointment by me, and the manner in which they have performed the duties of their respective offices has amply justified the wisdom of selecting for these executive positions men of such experience.

To these men, as well as to the individual members of a large corps of assistants, I desire in these closing words to express my thanks for the faithful service and hearty coöperation that has helped me to achieve whatever success I have attained in the administration of my office. There are several State officials and departments that I have been more or less closely associated with in performing my duties. To these men also and to the members of the Legislature I wish to give expression to my appreciation for invariable courtesy and assistance.

Respectfully submitted,
FRANK M. WILLIAMS,
State Engineer and Surveyor.

Engineering Expenses for the Fiscal Year Ended September 30, 1910

Table of Contents Completed During the Fiscal Year Ended September 30, 1910

Table of Contracts Pending September 30, 1910

Engineering Expenses for Fiscal Year Ended September 30, 1910.

Ordinary Repairs to Canals.

WORK.	Act.		Division.	Amount.	Total.
	Chap.	Year.			
Erie canal	432	1909	Eastern	$7,992 28	$12,000 00
Champlain canal	432	1909	Eastern	4,007 72	
Erie canal	432	1909	Middle	$8,871 70	9,000 00
Black River canal	432	1909	Middle	68 40	
Cayuga and Seneca canal	432	1909	Middle	59 90	
Erie canal	432	1909	Western	$10,204 53	10,204 53
Total	....	......	....	....	$31,204 53

Construction of Barge Canal.

WORK.	Act.		Division.	Amount.	Total.
	Chap.	Year.			
Barge canal, head office account	147 195	1903 1909	Eastern	$281,355 73	$581,040 97
Erie	147 195	1903 1909	Eastern	198,125 03	
Champlain	147 195	1903 1909	Eastern	101,560 21	
Barge canal, Erie	147 195	1903 1909	Middle	$105,938 79	177,222 97
Oswego	147 195	1903 1909	Middle	45,475 47	
Cayuga and Seneca	391	1909	Middle	25,808 71	
Barge canal, Erie	147 195	1903 1909	Western	$172,020 59	172,020 59
Total	....	......	....	....	$930,284 53

Bureau of Bridges.

WORK.	ACT.		Division.	Amount.	Total.
	Chap.	Year.			
Bureau of bridges	433 513	1909 1910	Eastern	$1,453 57	
Total	....	......	....	....	$1,453 57

Special Work.

WORK.	ACT.		Division.	Amount.	Total.
	Chap.	Year.			
Seneca street bridge, Utica	454	1909	Middle	$1,684 65	
Franklin street bridge, Syracuse	453	1909	Middle	2,683 13	
Washington street bridge, Rome	522	1910	Middle	83 02	$4,450 80
Allen street bridge, Rochester	291	1908	Western	$447 57	
Georgia street bridge, Buffalo	452	1909	Western	980 82	1,428 39
Total	....	......	....	....	$5,879 19

Special Surveys.

WORK.	ACT.		Division.	Amount.	Total.
	Chap.	Year.			
Examination of monuments and maps	433 513	1909 1910	Eastern	$6,409 82	
Court of Claims surveys	578 433	1907 1909	Eastern	711 39	
Mapping canal lands	199	1910	Eastern	2,323 69	
Topographic survey	433 513	1909 1910	Eastern	7,469 77	
Hydrographic survey	433 513	1909 1910	Eastern	1,426 35	$18,341 02
Court of Claims surveys	578 466 433	1907 1908 1909	Middle	$2,033 20	
Cayuga and Seneca canal	433	1909	Middle	13,833 36	15,866 56
Court of Claims surveys	578	1907	Western	$271 82	271 82
Total	....	......	....	....	$34,479 40

Summary of Engineering Expenses for the Fiscal Year Ended September 30, 1910.

DIVISION.	Ordinary repairs to canals.	Construction of Barge canal.	Bureau of bridges.	Special work.	Special surveys.	Total.
Eastern	$12,000 00	$581,040 97	$1,453 57	....	$18,341 02	$612,835 56
Middle	9,000 00	177,222 97	....	$4,450 80	15,866 56	206,540 33
Western	10,204 53	172,020 59	....	1,428 39	271 82	183,925 33
Totals	$31,204 53	$930,284 53	$1,453 57	$5,879 19	$34,479 40	$1,003,301 22

TABLE OF CONTRACTS COMPLETED DURING THE FISCAL YEAR ENDED SEPTEMBER 30, 1910.

CONTRACTOR.	Date of contract.	Character of work.	Division.	ACT.		Appropriation.	Engineer's preliminary estimate.	Contract price.	Final payment.
				Chap.	Year.				
National Construction Co.	Nov. 1, 1906	Constructing stairways for lift bridge at Catherine street, Syracuse	Middle	683	1906	$1,500 00	$1,065 50	$1,500 00	$1,500 00
Wm. T. McKibbin Co.	Jan. 15, 1909	Allen street bridge, Rochester	Western	291	1908	....	....	26,708 40	24,481 48

Construction of Barge Canal.

Chapter 147, Laws of 1903, and amendatory laws.

CONTRACTOR.	Date of contract.	Character of work.	Division.	Engineer's preliminary estimate.	Contract price, as affected by alterations.	Final payment.
Groton Bridge Co.	Aug. 10, 1906	Contract No. 7, Erie and Champlain canals — Bridges on Contracts Nos. 2, 3, 4, 5 and 6	Eastern Middle Western	$102,122 70	$101,929 95	$98,929 19
Lake Erie Dredging Co.	April 6, 1908	Contract No. 26, Champlain canal — Hudson river near Fort Edward	Eastern	60,225 00	40,057 00	35,443 24
Henry Tosh & Son	Jan. 11, 1909	Contract No. 38, Erie canal — Wapping's bridge	Western	20,131 25	16,869 90	16,286 67

TABLE OF CONTRACTS PENDING SEPTEMBER 30, 1910.

CONTRACTOR.	Date of contract.	Character of work.	Division.	ACT.		Appropriation.	Engineer's preliminary estimate.	Contract price, as affected by alterations	Payments to September 30, 1910.
				Chap.	Year.				
N. D. Peters Co.	Nov. 19, 1909	Seneca street bridge, Utica	Middle....	454	1909	....	$19,000 00	$19,571 25	$15,318 00
Cunningham-Woodard Co.	....	Raising highway at contract No. 78, near Fulton.	Middle....	......	......	....	11,627 50	11,627 50	310 00
Lupfer & Remick......	Jan. 29, 1910	Georgia street bridge, Buffalo..................	Western...	452	1909	....	18,371 00	18,121 00	14,274 00

Construction of Barge Canal.

Chapter 147, Laws of 1903, and amendatory laws.

CONTRACTOR.	Date of contract.	Character of work.	Division.	Engineer's preliminary estimate.	Contract price, as affected by alterations.	Payments to September 30, 1910.
Empire Engineering Corporation..	April 18, 1905	Contract No. 1, Champlain canal — Hudson river, Northumberland to Fort Miller and Crocker's Reef to Fort Edward..........	Eastern.....	$619,846 00	$580,423 57	$471,620
Ferguson Contracting Company...	April 3, 1905	Contract No. 2, Erie canal — Through Waterford to Contract No. 11..........	Eastern.....	1,022,640 00	950,506 00	694,390
*Holler & Shepard..........	Dec. 8, 1909	Contract No. 2-E, Erie canal — Through Waterford to Contract No. 11..........	Eastern.....	263,189 40	266,067 90	137,560
Sundstrom & Stratton..........	April 4, 1905	Contract No. 3, Champlain canal — Fort Miller to Crocker's Reef..........	Eastern.....	760,576 00	657,273 09	633,290
Pittsburg-Eastern Company......	May 22, 1906	Contract No. 8, Erie canal — Dams and locks at Scotia, Rotterdam and Cranesville..........	Eastern.....	1,518,382 00	1,516,788 98	824,550
Fort Orange Construction Co.....	May 21, 1906	Contract No. 11, Erie canal — From Contract No. 2 to Mohawk river..........	Eastern.....	1,671,385 00	1,355,941 40	975,830
Penn Bridge Company..........	Nov. 7, 1908	Contract No. 13, Erie canal—Bridges on Contracts Nos. 18 and 12..........	Eastern..... Middle......	29,775 00	28,125 50	16,500
Acme Engineering & Contracting Company..........	Sept. 10, 1907	Contract No. 14, Erie canal — Mohawk river, Crescent to Rexford Flats aqueduct; dams at Crescent and Mindenville; dams and locks at Vischer's Ferry, Canajoharie, Yosts and Fort Plain..........	Eastern.....	2,875,570 00	2,966,815 20	1,948,800
Atlantic, Gulf & Pacific Company..	Aug. 9, 1906	Contract No. 15, Champlain canal — Whitehall to Comstock..........	Eastern.....	1,380,760 00	1,477,216 75	1,091,040
United Construction Company....	Dec. 20, 1906	Contract No. 16, Erie and Champlain canals — Bridges on Contracts Nos. 11, 25 and 27..........	Eastern.....	70,719 00	69,076 95	5,380
The Scofield Company.......... *Alexander Murdock..........	Dec. 29, 1906 Mar. 3, 1908	Contract No. 17, Erie canal — Dams and locks at Amsterdam and Tribes Hill..........	Eastern.....	883,926 00 836,220 76	842,613 28 812,286 46	57,560 560,890
Kelley Bros. Contracting Co......	Dec. 28, 1906	Contract No. 18, Erie canal — Mindenville to Castle creek..........	Eastern.....	785,980 00	856,251 59	456,020
Houston Barnard..........	Aug. 20, 1909	Contract No. 20-A, Erie canal — Little Falls to Castle creek..........	Eastern.....	499,000 00	490,592 50	41,730
S. Pearson & Son, Inc..........	Aug. 2, 1909	Contract No. 20-B, Erie canal — Mohawk river, Mindenville to Canajoharie..........	Eastern.....	848,540 00	933,194 00	9,260
American Pipe & Construction Co.	Aug. 18, 1909	Contract No. 20-C, Erie canal — Mohawk river, Canajoharie to Yosts..........	Eastern.....	570,600 00	585,720 00	7,640

*Contract relet.

TABLE OF CONTRACTS PENDING SEPTEMBER 30, 1910 — (*Continued*).

Construction of Barge Canal — (Continued).

Chapter 147, Laws of 1903, and amendatory laws.

CONTRACTOR.	Date of contract.	Character of work.	Division.	Engineer's preliminary estimate.	Contract price, as affected by alterations.	Payments to September 30, 1910.
American Pipe & Construction Co.	Aug. 18, 1909	Contract No. 20-D, Erie canal — Mohawk river, Yosts to Rexford Flats	Eastern	$2,260,000 00	$2,681,040 40	0
Atlantic, Gulf & Pacific Company	Nov. 19, 1906	Contract No. 25, Champlain canal — Comstock to Dunhams Basin	Eastern	1,849,831 00	1,691,819 00	$1,204,160
Kinser Construction Company	Nov. 23, 1906	Contract No. 27, Champlain canal — Dunhams Basin to Fort Edward	Eastern	998,920 00	723,268 61	378,650
Maryland Dredging & Contracting Company	April 3, 1909	Contract No. 29, Erie canal — Sterling creek to Herkimer-Oneida county line	Eastern	812,350 00	676,700 66	166,760
Acme Engineering & Contracting Company	July 16, 1909	Contract No. 30, Erie canal — Mohawk river, Little Falls to Sterling creek	Eastern	2,650,500 00	2,591,867 75	212,880
Casey & Murray	Sept. 2, 1908	Contract No. 31, Erie canal — Through Little Falls; Rocky Rift dam	Eastern	813,800 00	831,391 78	475,440
Penn Bridge Company	April 19, 1909	Contract No. 32, Champlain Canal — Lock-gates, etc., on Contracts Nos. 3, 25 and 27	Eastern	59,820 00	46,797 00	42,530
Penn Bridge Company	Jan. 7, 1910	Contract No. 33, Erie, Champlain and Oswego canals — Lock-gates, etc., on Contracts Nos. 2, 10, 11 and 15	Eastern Middle	183,618 60	199,639 70	0
J. D. Miller	May 3, 1910	Contract No. 36, Erie canal — Operating winches for movable dams in Mohawk river	Eastern	72,000 00	44,800 00	0
Scott Brothers	Dec. 13, 1909	Contract No. 54, Champlain canal — Lock at Fort Edward	Eastern	232,908 00	250,590 10	12,310
Shanley-Morrissey, Inc.	Nov. 23, 1908	Contract No. 68, Champlain canal — Locks at Mechanicville, Stillwater and Northumberland	Eastern	1,175,623 00	1,027,135 60	661,630
I. A. Hodge & Company, Inc.	Dec. 11, 1909	Contract No. 69, Champlain canal — Lock at lower Mechanicville	Eastern	270,675 00	240,061 00	64,190
Shanley-Morrissey, Inc.	Jan. 11, 1910	Contract No. 70, Champlain canal — Hudson river, Waterford to Lock No. 1	Eastern	749,300 00	779,636 50	136,470
Shanley-Morrissey, Inc.	Jan. 11, 1910	Contract No. 71, Champlain canal — Hudson river, Lock No. 1 to lower Mechanicville	Eastern	1,502,100 00	1,561,119 00	132,840
Shanley-Morrissey, Inc.	Dec. 14, 1909	Contract No. 72, Champlain canal — Hudson river, lower Mechanicville to Stillwater	Eastern	1,439,733 00	1,202,658 00	127,380
E. M. Graves	May 26, 1910	Contract No. 73, Champlain canal — Hudson river, Stillwater to Northumberland	Eastern	778,960 00	767,467 00	6,000

D'Olier Engineering Company	April 12, 1910	Contract No. 90, Erie, Champlain and Oswego canals — Power-supply at Baldswinsville, Smith's Basin, Comstock and Whitehall; operating equipment at Lock No. 24, Erie, at Nos. 9, 11 and 12, Champlain, and at Nos. 1, 2, 7 and 8, Oswego	Eastern. Middle..	180,630 00	178,197 00	1,560
Empire Engineering Corporation..	April 18, 1905	Contract No. 4, Erie canal — The 4¾ miles east of Oneida lake	Middle......	812,560 00	726,779 64	687,380
Empire Engineering Corporation..	April 18, 1905	Contract No. 5, Erie canal — Mosquito Point to Fox Ridge	Middle......	421,252 00	375,871 07	125,820
McDermott Contracting Company	June 7, 1906	Contract No. 10, Oswego canal — Through Fulton.....	Middle......	1,149,988 00	1,111,964 57	606,800
James Stewart & Company.......	Sept. 23, 1907	Contract No. 12, Erie canal — Oneida lake to Mosquito Point	Middle......	3,087,060 00	3,514,819 16	1,230,140
M. Fitzgerald.................	Sept. 24, 1910	Contract No. 22, Erie canal — Bridges on part of Contract No. 12	Middle......	107,126 00	110,268 00	0
Gilmour-Horton-Allen Company...	Sept. 16, 1907	Contract No. 35, Oswego canal — Through Oswego....	Middle......	752,760 00	714,027 45	303,490
James Stewart & Company.......	April 15, 1910	Contract No. 39, Oswego canal — Dredging Oswego river, etc. Three River Point to Fulton................	Middle......	972,900 00	1,048,674 40	26,430
Shanley-Morrissey, Inc...........	July 9, 1909	Contract No. 42, Erie canal — Herkimer-Oneida county line to Oriskany road	Middle......	1,312,814 00	1,201,048 50	229,480
M. A. Talbot Company..........	Oct. 15, 1909	Contract No. 43, Erie canal — Oriskany road to Mud creek........................	Middle......	1,529,885 00	1,335,998 10	0
Scott Brothers.................	Jan. 8, 1910	Contract No. 44, Erie canal — Mud creek to Contract No. 4........................	Middle......	1,926,093 00	1,748,679 00	109,760
Scott Brothers.................	May 6, 1908	Contract No. 45, Erie canal — Through Baldwinsville; Caughdenoy dam........................	Middle......	425,124 00	472,802 35	420,460
Kinser Construction Company....	Nov. 23, 1908	Contract No. 46, Erie canal — Fox Ridge to Galen town line........................	Middle......	1,367,583 00	1,216,138 10	356,510
Buffalo Dredging Company.......	Sept. 23, 1910	Contract No. 50, Erie canal — Dam, waste-gates and spillway at Hinckley........................	Middle......	1,076,000 00	963,415 00	0
Scott Brothers.................	Aug. 16, 1909	Contract No. 53, Oswego canal — Through Phoenix....	Middle......	200,500 00	167,385 00	137,530
Arthur McMullen..............	Oct. 19, 1908	Contract No. 55, Erie canal — Delta reservoir..........	Middle......	1,014,525 00	929,836 00	579,410
Cunningham-Woodard Company..	Aug. 18, 1910	Contract No. 78, Oswego canal — Dike along Oswego river near Fulton........................	Middle......	55,154 00	49,025 95	23,560
Lupfer & Remick	Sept. 23, 1910	Contract No. 79, Oswego canal — Bridge street bridge at Oswego........................	Middle......	39,735 00	37,480 00	70
Frank A. Maselli...............	May 3, 1905	Contract No. 6, Erie canal — Buffalo road, southwest of Rochester, to near South Greece..............	Western.....	1,381,661 00	1,026,549 80	982,350
Thos. Crimmins Contracting Co..	Mar. 18, 1908	Contract No. 9, Erie canal — Eagle Harbor to Beal's bridge........................	Western.....	724,014 00	755,995 00	600,060
Great Lakes Construction Co.....	Nov. 26, 1906	Contract No. 19, Erie canal — Sulphur Springs guard-lock to Ellicott creek........................	Western.....	1,038,245 00	891,400 91	550,060
Lane Brothers Company.........	April 17, 1910	Contract No. 21, Erie canal — Genesee river to near N. Y. C. bridge........................	Western.....	1,475,900 00	1,323,150 00	141,730
Millard & Lupton Company......	Aug. 18, 1909	Contract No. 23, Erie canal — Kings Bend to Genesee river........................	Western.....	2,166,600 00	1,849,342 00	215,740
United Engineering & Contracting Company....................	Nov. 27, 1908	Contract No. 40, Erie canal — Locks at Lockport to Sulphur Springs guard-lock........................	Western.....	2,516,743 00	2,190,870 30	759,850

TABLE OF CONTRACTS PENDING SEPTEMBER 30, 1910 — (*Concluded*).

Construction of Barge Canal — (Concluded).

Chapter 147, Laws of 1903, and amendatory laws.

CONTRACTOR.	Date of contract.	Character of work.	Division.	Engineer's preliminary estimate.	Contract price, as affected by alterations.	Payments to September 30, 1910.
Butler Bros. Construction Co.....	Dec. 5, 1908	Contract No. 41, Erie canal — Irondequoit creek crossing..	Western.....	$383,190 00	$281,330 00	$233,760
Crowell-Sherman-Stalter Co......	Nov. 30, 1908	Contract No. 47, Erie canal — Town of Galen to Lyons..	Western.....	1,434,148 00	1,273,071 35	553,650
Bellew & Merritt Company.......	Feb. 21, 1910	Contract No. 49, Erie canal — Palmyra to Wayne-Monroe county line..................................	Western.....	765,679 00	750,279 25	30,470
Empire Engineering Corporation..	Aug. 6, 1908	Contract No. 60, Erie canal — Near South Greece to near Adams Basin..................................	Western.....	1,267,301 00	1,475,891 83	939,850
Cleveland & Sons Company......	Oct. 13, 1908	Contract No. 61, Erie canal — Near Adams Basin to Monroe-Orleans county line......................	Western.....	1,000,219 00	1,047,994 00	269,230
I. M. Ludington's Sons, Inc......	Aug. 11, 1910	Contract No. 62, Erie canal — Monroe-Orleans county line to Eagle Harbor............................	Western.....	2,151,470 00	2,347,836 00	0
H. S. Kerbaugh, Inc.............	June 3, 1910	Contract No. 63, Erie canal — Monroe-Wayne county line to Kings Bend..............................	Western.....	2,184,083 00	1,990,043 00	14,510
Empire Engineering Corporation..	Aug. 6, 1908	Contract No. 64, Erie canal — Near Prospect street, Medina, to near Gasport..........................	Western.....	1,207,930 00	1,312,157 79	449,160
Empire Engineering Corporation..	Sept. 22, 1908	Contract No. 66, Erie canal — Near Gasport to near locks at Lockport..............................	Western.....	751,039 00	821,032 72	374,250
Larkin & Sangster...............	Sept. 3, 1910	Contract No. 67, Erie canal — Locks at Lockport......	Western.....	1,290,880 00	1,149,401 25	0
Rec'rs J. B. & J. M. Cornell Co....	Mar. 1, 1910	Contract No. 75, Erie canal — Guard-gate superstructures on contracts Nos. 60, 61 and 64...............	Western.....	39,525 00	42,917 00	0

REPORT

OF THE

DIVISION ENGINEER

OF THE

EASTERN DIVISION

For the Fiscal Year Ended September 30, 1910

EASTERN DIVISION.

STATE OF NEW YORK,
DEPARTMENT OF STATE ENGINEER AND SURVEYOR,
EASTERN DIVISION.

ALBANY, *October* 1, 1910.

Hon. FRANK M. WILLIAMS, *State Engineer and Surveyor:*

Sir.— I have the honor to submit herewith my annual report as Division Engineer of the Eastern Division of your Department for the fiscal year ended September 30, 1910.

In the State canal system is centered the chief work of this Division. This has consisted in the necessary engineering work in connection with the existing canals and also in making surveys and plans and in supervising the construction of the new Barge canal. For canal purposes the Eastern Division comprises that part of the State waterway system extending from the Hudson river at Albany to the east line of Oneida county and from the junction of the Erie and Champlain canals to the south end of Lake Champlain.

COURT OF CLAIMS SURVEYS.

The usual assistance has been given the Attorney-General in the trial of claims before the Court of Claims for damages alleged to have been caused by the State canals or some of their adjuncts. This work has consisted in the making of surveys and the giving of testimony on behalf of the State.

SURVEYS FOR STATE COMMISSIONS AND DEPARTMENTS.

Various surveys have been made during the year for work under State departments other than our own. These have included three for the State Architect and one each for the State Prison Commission and the State Armory Commission.

For the State Architect surveys were made of the prison site at Wingdale, Dutchess county, of the rifle range at Blauvelt, Rockland county, and of the Capitol boiler house site at Albany. For the Prison Commission a topographic survey was made at the custodial asylum known as Letchworth Village. For the Armory Commission a survey was made of the Rensselaerwyck rifle range, situated near the city of Rensselaer.

The cost of these surveys is borne by the commission or department for which they are made, but it often happens that the money is not available as soon as the survey is needed. In such cases, to avoid delays, the Division Engineer has been accustomed to advance the money to pay the men, but sometimes this has proved an injustice to other men in the Department, by compelling them to wait for their salaries until a succeeding month's allowance can be obtained from the State treasury. A loan fund, such as was recommended by the State Engineer a year ago, would obviate this difficulty.

STATE BOUNDARY LINE SURVEYS.

(Chapter 433, Laws of 1909; chapter 513, Laws of 1910.)

The work of surveying and monumenting the New York–Massachusetts and New York–Connecticut boundary lines has been done by men of the Eastern Division, under the supervision of the Deputy State Engineer.

MAPPING CANAL LANDS.

(Chapter 199, Laws of 1910.)

The first of the work under this law was performed within the Eastern Division, and up to the close of the fiscal year all operations have been confined to this division, but it is planned to extend the work to other parts of the state within two or three weeks.

The work consists mainly in relocating on the ground the boundary line, generally known as the "blue line" in New York canal nomenclature, of State canal property. Its prosecution demands a very careful and thorough examination of the records of both State and adjacent properties and a most judicious adjustment of the discrepancies that are found to exist.

BARGE CANAL.

(Chapter 147, Laws of 1903.)

To carry on the construction of the Barge canal, the practice, customary on large engineering works, of dividing the whole into a number of parts, has been followed. The work in these several parts, called residencies on the Barge canal, has been put in charge of resident engineers. In making my report on this work, I shall follow the precedent of several years and incorporate the reports which the several resident engineers have made to me. These accounts deal mainly with the work of construction, since the making of plans is done chiefly in the central office, under the direction of the Special Deputy State Engineer. As will be seen from these reports, the boundaries of the residencies as originally laid out have not been strictly adhered to and in certain cases the territories overlap. The chief instance of this was occasioned by the necessity of building certain dams in the lower reaches of the Mohawk before attempting to float dredges to excavate the river channel, and the consequent letting of contracts separately for structures and dredging, one of the dredging contracts extending over a considerable portion of two residencies. For supervising these operations, the two classes of work were assigned to different resident engineers. During the past year a new residency, No. 4-A, has been formed, one portion being taken from No. 4, of the Eastern Division, and another from No. 5, of the Middle Division.

A description of the several residencies and an enumeration of the engineers in charge are as follows:

Erie canal, Residency No. 1. From the Congress street bridge crossing the Hudson river at Troy to the west end of the lower Mohawk aqueduct at Crescent, including that portion of the Hudson river which is common to the main line of the canal and of the Champlain canal. H. O. Schermerhorn, Resident Engineer, with office at Waterford.

Erie canal, Residency No. 2. From the west end of the lower Mohawk aqueduct at Crescent, to the head of old lock No. 27, situated about three-fourths of a mile west of Cranesville, Montgomery county. E. J. Pickwick, Resident Engineer, with office at Schenectady.

Erie canal, Contracts Nos. 20-B, 20-C and 20-D. River dredging from deep water below Rexford Flats aqueduct to Mindenville. E. A. Lamb, Resident Engineer, with office at Amsterdam.

Erie canal, Residency No. 3. From the head of old lock No. 27 to the head of old lock No. 34 at Mindenville, Montgomery county. F. P. Williams, Resident Engineer, with office at Amsterdam.

Erie canal, Residency No. 4. From the head of lock No. 34, at Mindenville, to Sterling creek. Philip H. Dater, Resident Engineer, with office at Little Falls.

Erie canal, Residency No. 4-A. From Sterling creek, four miles east of the Herkimer–Oneida county line, which is the line between the Eastern and Middle Divisions, to Oriskany road, 8.76 miles west of the Herkimer–Oneida county line. S. M. Savage, Resident Engineer, with office at Utica.

Champlain canal, Residency No. 1. From the junction of the Erie canal and Champlain canal, in the Hudson river east of Waterford, to the foot of old lock No. 10, near Northumberland dam, Washington county. F. N. Sanders, Resident Engineer, with office at Mechanicville.

Champlain canal, Residency No. 2. From the foot of lock No. 10, near Northumberland dam, Washington county, to the highway crossing the present Champlain canal at Dunhams Basin, Washington county, including the Glens Falls feeder, dam and pond above. E. V. R. Payne, Resident Engineer, with office at Fort Edward.

Champlain canal, Residency No. 3. From the highway crossing the present Champlain canal at Dunhams Basin, Washington county, to Lake Champlain. D. B. La Du, Resident Engineer, with office at Whitehall.

The following pages contain the reports of the resident engineers, previously referred to, which describe the work done and also embody tabular statements showing the status of each contract at the close of the fiscal year.

ERIE CANAL, RESIDENCY NO. 1.

Resident Engineer H. O. Schermerhorn reports:

"This residency includes that section of the Erie canal extending from the Congress street bridge at Troy to the lower

Mohawk aqueduct at the village of Crescent. The work done during the year on this section has consisted of general office work, preparation of appropriation maps on contract No. 14 between Crescent and Rexford Flats, monumenting State right of way along the Mohawk river, preparation of final estimate on contract No. 2 and prosecution of construction operations on contracts Nos. 2-E, 11 and 33.

"*Office work.* During the year maps have been made for the appropriation of 190 parcels of land along the Mohawk river between Crescent and Rexford Flats. Maps have now been completed for all appropriated land between these points, aggregating 208 in number and comprising about 2,365 acres. Considerable work has also been done on the preparation of the final estimate of contract No. 2. This work is probably 75 per cent completed.

"*Surveys.* The State right-of-way line has been established and monumented along the north shore of the Mohawk river between the Crescent dam and the lower Mohawk aqueduct at the village of Crescent. Between these points 119 concrete monuments have been placed.

"*Contract No.* 2-E. This contract was let under date of December 8, 1909, and provides for the completing of the work originally included in contract No. 2, on which operations were suspended by order of the Canal Board, May 13, 1909. Work of construction was begun early in the spring and has continued in fairly good manner, considering the conditions presented by the uncompleted work on the original contract. The contractor removed about 23,000 cu. yds. or 50 per cent of the total excavation below lock No. 2 with a dipper dredge. The excavation and concrete floor in lock No. 2 has been completed. The retaining walls between lock No. 2 and the Champlain canal have been completed and the retaining wall on the south side of the prism between the mixing plant and lock No. 3 has been finished and the backfill made. Excavation and embankment have been made as the construction of the walls progressed, in order to minimize the rehandling of material. The three main items of the contract, namely,— excavation, embankment and concrete, have been closely interrelated and to a certain extent they have regulated the progress of the work. The concrete floor between lock No. 2

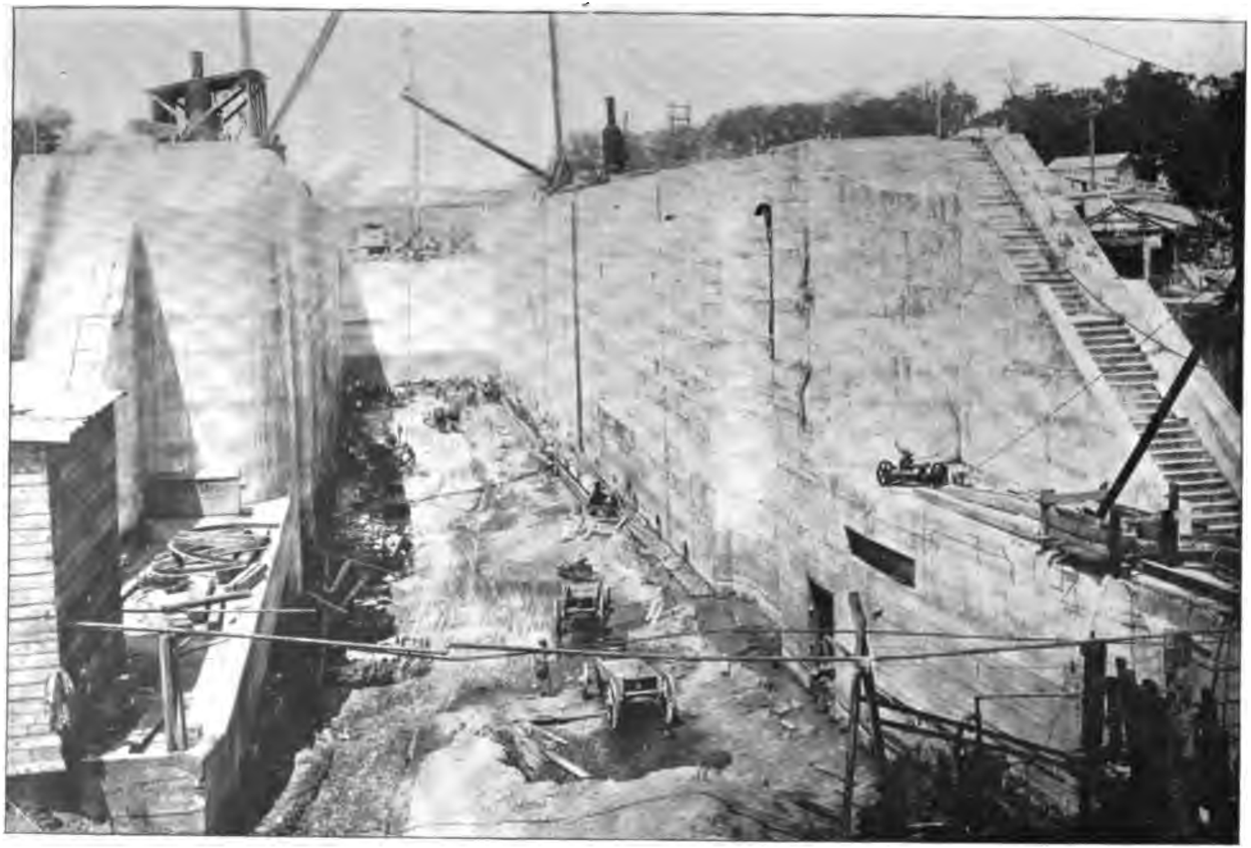
and the mixing plant has been practically finished. Most of the excavation for pool and prism above lock No. 3 has also been completed, with teams and hand labor.

"About 76,000 cu. yds. of excavation, 27,000 cu. yds. of embankment and 13,500 cu. yds. of concrete have been made, these being the principal items of the contract. The total amount and percentage of work done during the year are given in the accompanying table.

" The work on this contract has been under the direction of C. R. Chase, Assistant Engineer, and later under O. Hasbrouck, Assistant Engineer.

ITEMS OF WORK.	Preliminary estimate, as modified by alteration 1.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
All excavation … cu. yds.	139,900	76,136	76,136	55	55
Sheeting and bracing … ft. B. M.	26,400	5,100	5,100	19	19
Forming embankment … cu. yds.	68,300	27,432	27,432	40	40
Lining … cu. yds.	785	119	119	15	15
Timber and plank … ft. B. M.	148,500	20,000	20,000	13	13
Spruce, timber and plank … ft. B. M.	1,000	900	900	Finished	Finished
Round timber in cribs … lin. ft.	51,300	0	0	0	0
Foundation piles, 15 ft. long … No.	2,015	1,153	1,153	57	57
Foundation piles, 20 ft. long … No.	35	0	0	0	0
Second-class concrete … cu. yds.	21,745	13,539	13,539	62	62
Wash wall … cu. yds.	1,200	0	0	0	0
Stone filling … cu. yds.	5,540	0	0	0	0
Iron castings … lbs.	11,880	1,126	1,126	9	9
Structural steel … lbs.	23,800	4,453	4,453	18	18
White oak in miter-sills … ft. B. M.	3,000	2,640	2,640	Finished	Finished
Cobblestone gutters … sq. yds.	70	25	25	40	40
Relaying old flagging … sq. ft.	960	0	0	0	0
Fender fastenings … No.	460	125	125	30	30
Stone curbs … lin. ft.	125	0	0	0	0
Stone curbs, reset … lin. ft.	95	0	0	0	0
Cobblestone gutters, relaid … sq. yds.	75	0	0	0	0
Crosswalks, relaid … sq. yds.	75	0	0	0	0
Change in hydrant and connections …	Lump sum	Finished	Finished	Finished	Finished
Change in steps and stoops …	Lump sum	0	0	0	0
Removing concrete … cu. ft.	304	0	0	0	0
Dressing concrete surface … sq. ft.	130	0	0	0	0
Cast iron quoin-plates … lbs.	9,740	6,004	6,004	62	62
24-in. vitrified pipe, laid … lin. ft.	130	0	0	0	0
Portland cement sidewalk … sq. ft.	1,930	0	0	0	0
Crosswalks … sq. ft.	250	0	0	0	0
Wooden fence … lin. ft.	200	0	0	0	0
Iron fence … lin. ft.	235	0	0	0	0
Treating fenders … lin. ft.	4,610	3,240	3,240	70	70

"*Contract No.* 11. Construction work continued on this contract until about the middle of December, 1909, when all work stopped, except one steam-shovel and the rock channeling machine, which operated all winter. Work again started about April 1, 1910, and has continued since that date. The principal



BARGE CANAL, CONTRACT NO. 2-E.

Lock No. 2, at Waterford — built at the entrance of the Erie canal into a mouth of the Mohawk river just above its confluence with the Hudson.

contract items on which work has progressed are excavation, embankment, rock channeling and concrete.

"The amount of excavation done has been small, on account of the difficulty of placing the material in embankment. The Bucyrus steam-shovel removed from the by-pass at lock No. 4 about 15,000 cu. yds. of material, which was placed in first-class embankment along the core walls at locks Nos. 4 and 5. The by-pass excavation is now nearly completed. The Vulcan steam-shovel completed the excavation of lock No. 6 and for the retaining wall on the north side between locks Nos. 5 and 6 and then moved to the rock cut above lock No. 6 about April 1, 1910. It has since that time removed 42,000 cu. yds., reaching the guard-gate and completing the excavation for the same about September 1. There still remains to be excavated about 48,000 cu. yds. in the cut between lock No. 6 and the Mohawk river. The rock excavated during the year has been placed in spoil bank No. 8 and in second-class embankment at locks Nos. 4 and 6.

"During the year about 14,500 sq. ft. were channeled in the prism cut between lock No. 6 and the Mohawk river. On May 14 all the channeling on the north side was completed and the channeler moved to the south side of the prism, where about 9,000 sq. ft. still remain to be done.

"About 38,000 cu. yds. of second-class concrete were placed. Of this amount 27,000 cu. yds. were put in lock No. 6. About 17,000 cu. yds. were placed in the floor of lock No. 4 and in the north retaining wall below lock No. 4. The concrete docking between locks Nos. 4 and 5 has been completed on the north side and about 50 per cent completed on the south side. 3,000 cu. yds. of concrete were used here. Between locks Nos. 5 and 6, the retaining wall on the north side was completed and a number of concrete docking piers on the south side were finished. About 3,200 cu. yds. of material were used between these locks. Above lock No. 6 a few yards were placed in the guard-gate masonry and about 2,900 cu. yds. in the north retaining wall at the Mohawk river.

"The work on this contract has been under the direction of E. J. Becker, Assistant Engineer, during the year.

"The table below gives a statement of the condition of the work on October 1, 1910.

ITEMS OF WORK.	Preliminary estimate, as modified by alterations 1, 2 and 4.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing....................................	Lump sum	0	90%	0	90
Grubbing.............................cu. yds.	15,000	0	8,094	0	54
Excavation...........................cu. yds.	801,750	90,538	604,864	11.3	75.4
Sheeting and bracing.................ft. B. M.	200,000	0	223,958	0	112
Rock channeling.......................sq. ft.	96,000	14,492	58,878	15.1	61.3
Embankment, first-class..............cu. yds.	116,300	12,427	74,550	10.7	64.1
Embankment, second-class.............cu. yds.	275,100	65,443	184,375	23.8	67
Lining...............................cu. yds.	6,290	0	2,245	0	35.7
Spruce...............................ft. B. M.	129,500	0	0	0	0
White oak............................ft. B. M.	9,600	2,840	7,100	29.6	74.0
Foundation piles, 15 ft. long................No.	89	0	75	0	Finished
Foundation piles, 20 ft. long................No.	261	0	258	0	Finished
Concrete.............................cu. yds.	163,160	37,908	120,367	23.2	73.8
Wash wall............................cu. yds.	12,000	0	0	0	0
12-in. vitrified pipe, laid.................lin. ft.	290	0	0	0	0
Back filling.........................cu. yds.	290	0	0	0	0
Cobblestone paving...................sq. yds.	600	0	0	0	0
Steel castings..............................lbs.	20,000	6,070	18,692	30.4	Finished
Iron castings, plain........................lbs.	373,830	64,819	259,782	17.3	69.5
Iron castings, machined.....................lbs.	90,100	27,973	83,987	31.0	Finished
Metal reinforcement.........................lbs.	429,600	139,305	140,964	32.4	32.8
Expansion bolts.............................No.	614	0	0	0	0
¾-in. log chains............................lbs.	20,000	0	0	0	0
Gas pipe railing........................lin. ft.	500	0	0	0	0
Cast iron quoin-plates......................lbs.	46,000	11,568	43,155	25.1	93.8
Removing concrete....................cu. yds.	216	0	188	0	Finished
Dressing concrete.....................sq. ft.	100	0	91	0	Finished

"*Contract No.* 33. This contract in part provides for the construction of lock-gates, valves, needle-beams and guard-gate on the Waterford flight of locks. The contractor has been installing the necessary plant, but no contract work has yet been done."

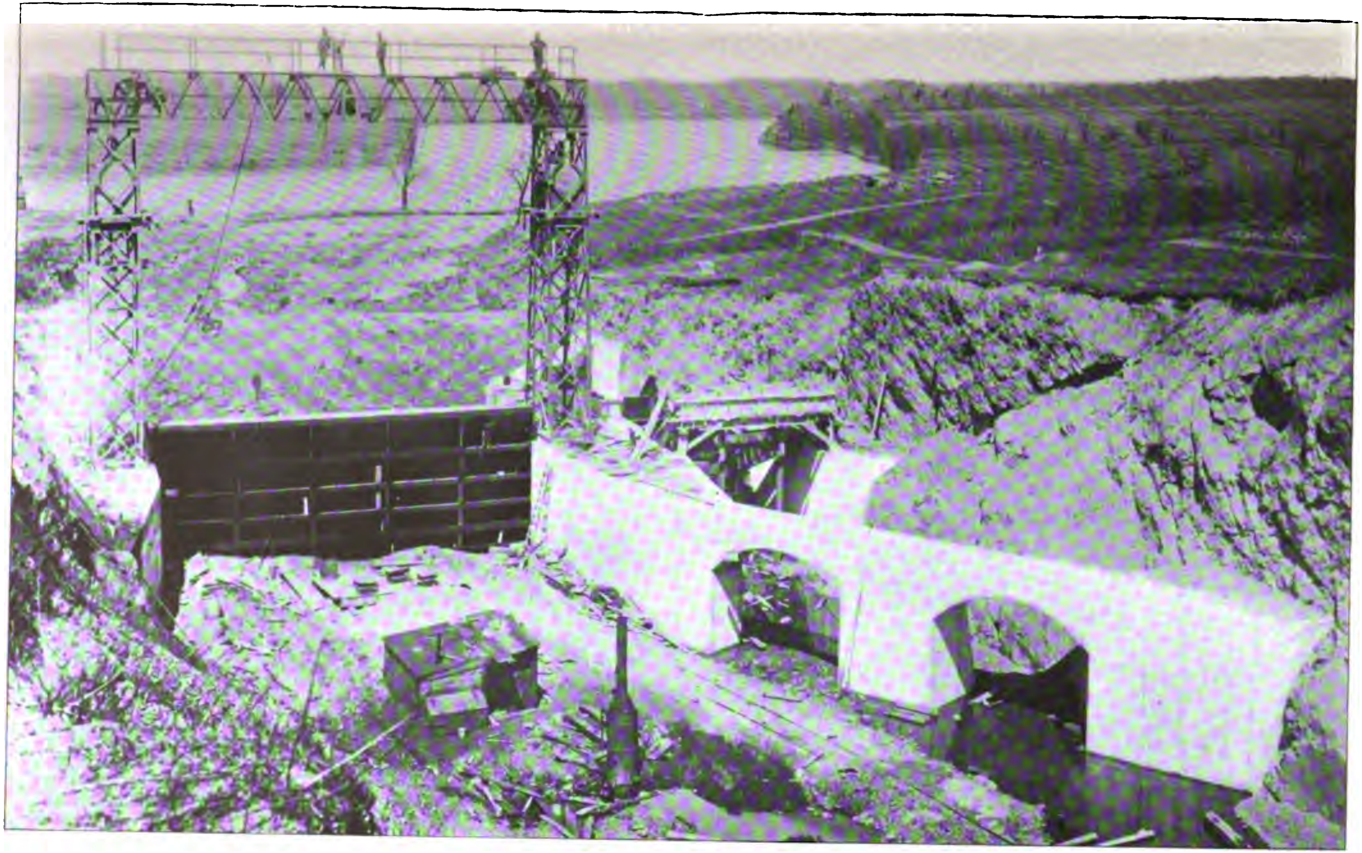
ERIE CANAL, RESIDENCY NO. 2.

Resident Engineer E. J. Pickwick reports:

"This residency extends from the lower Mohawk aqueduct at Crescent to the head of the old lock No. 27, at Cranesville, a distance of 27 miles, and our work also includes the Crescent dams, which are within the limits of Residency No. 1.

"The work of appropriating lands for contract No. 14 is continued under the direction of H. O. Schermerhorn, Resident Engineer for Residency No. 1, and a part of the dredging in Residency No. 2 is included under contract No. 20-D and is supervised by Resident Engineer E. A. Lamb.

"The past year has been occupied largely in a vigorous prosecution of the work on the following structures: Dam No. 2 and



Barge Canal, Contract No. 11.

Guard-gate and by pass at head of land line between Hudson and Mohawk rivers. The entrance into the Mohawk just above Crescent dam is also shown.

highways at Crescent; dam No. 3 and lock No. 7 at Vischer's Ferry — structures under sections 1 and 2, of contract No. 14; also movable dams Nos. 4, 5 and 6 and locks Nos. 8, 9 and 10, under contract No. 8 — structures located respectively at Scotia, Rotterdam and Cranesville. Miscellaneous work for the year has consisted largely of data and reports for appropriated lands and claims, gage readings of the lower Mohawk river, inspection and reshipment of 37,000 barrels of cement for use in State work outside of this residency; studies for power house locations at Rotterdam and Cranesville, together with appropriation surveys, which have been rerun on the south side of the Mohawk river from Aqueduct to Vischer's Ferry. About 300 appropriation monuments have been made at lock No. 7 and 100 of these have been placed at the limits of Barge canal lands from Aqueduct to lock No. 7.

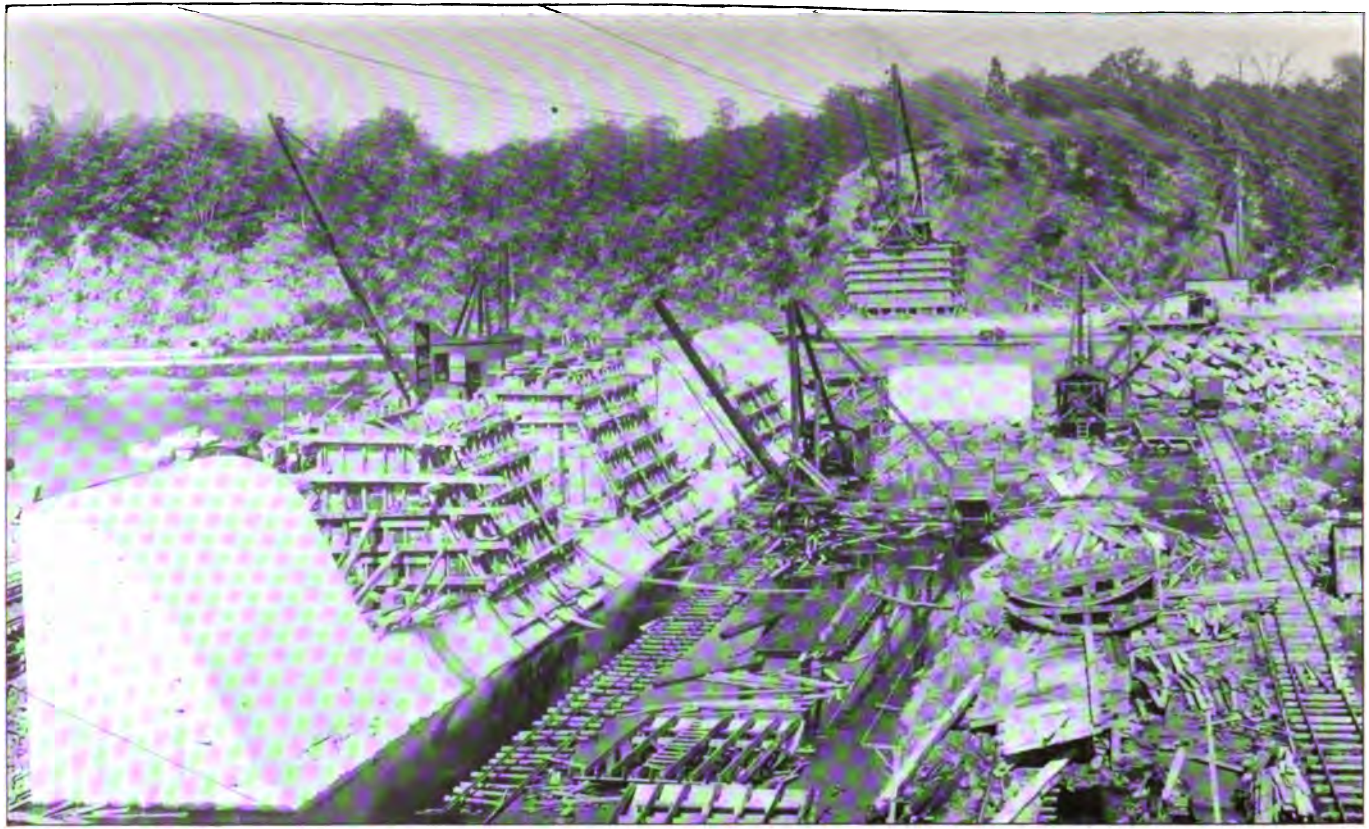
" *Contract No.* 14, *Sections* 1 *and* 2. At dam No. 2, Crescent, work was continued until December 24, 1909, on the east end of dam " A," with adjacent abutment, which includes forebay for power purposes, on the west end of dam " B," with abutment "D" and on dam " C." The dams at this site are completed, except for six openings, which carry the flow of the river. The following quantities show the volume of work done during the year: Excavation, 2,400 yds.; concrete, 9,100 yds.; metal in head-gates, 38.8 tons. The plant used consisted of a 250-horse-power compressor, electrically driven (power being obtained from the Spiers Falls high power line through oil transformers and induction motors), McMyler traveller, derrick boat, travelling derrick, 4 guy derricks, Thew steam-shovel, drills, pumps, 2-yd. Hains concrete mixer, trains, etc. The quarry and crusher at this site were in operation until July 8, 1910, stone being crushed for first-class concrete for dam No. 3, Vischer's Ferry, as well as for the structures at Crescent. At the Crescent highways surfacing was completed late in the fall of 1909 and after placing 920 feet of guard-fences, the roads were opened to the public.

" At dam No. 3, lock No. 7, Vischer's Ferry, work was continued until January 15, 1910, and again resumed about April 1, 1910. The lock and its approaches are practically completed, including the gates, buffer-beams, and all lock equipment except the valves. The core-wall from the lock to the high ground on the south shore is about 90 per cent completed. Work on dams "E" on island and "F" in the north channel were begun in April, 1910. A coffer was built above the site of dam "F" in the north channel and foundation for this entire structure uncovered. The following quantities show the volume of work performed at this site: Excavation, 71,200 yds.; embankment, 37,500 yds.; concrete, 16,400 yds.; lumber, 64,000 ft., and metal, 164 tons. The plant used consists of two 250-horse-power compressors driven by steam from five 100-horse-power Erie boilers, two Lidgerwood cable ways, 1,000 feet long, three travelling derrick, two clamshell derricks, one 2-yard Hains concrete mixer, trains, pumps, etc., and repair shops.

"On contract No. 14, sections 1 and 2, the average daily force has been 234 men and 1 team, working one eight-hour shift; the maximum daily force, 400 men and 2 teams, working one eight-hour shift.

"The following table gives the summary of work done during the year and the total completed to date:

ITEMS OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing....................................	1	0	30%	0	30
Grubbing............................cu. yds.	2,975	0	46.3	0	1.6
All excavation.......................cu. yds.	387,325	75,355	262,074	19.4	67.6
Sheeting and bracing..................ft. B. M.	30,300	9,200	9,700	30.4	32
First-class embankment..................cu. yds.	108,153	36,325	65,783	20.9	38
Second-class embankment................cu. yds.	30,560	1,224	11,870	4.0	38.8
Lining.................................cu. yds.	1,300	355	1,132	27.3	87.1
Sawed lumber (yellow pine or Douglas fir) ft. B. M.	64,660	1,380	1,380	2	2
Sawed lumber (hemlock)..............ft. B. M.	319,000	0	216,700	0	68
White oak in miter-sills and gates......ft. B. M.	9,600	9,200	9,200	95.8	95.8
Sawed lumber (white oak)..............ft. B. M.	68,000	47,500	47,500	70	70
Sawed lumber (creosoted yellow pine)..ft. B. M.	14,900	6,600	6,600	44.3	44.3
Stone filling in cribs....................cu. yds.	9,085	0	2,827	0	31.1
Foundation piles, 16 ft. long...............No.	839	0	787	0	93.8
Foundation piles, 20 ft. long...............No.	84	0	4	0	4.8
Mooring piles, 20 ft. long..................No.	40	0	14	0	35
First-class concrete....................cu. yds.	21,000	3,510	16,279	16.7	77.5
Second-class concrete...................cu. yds.	135,500	22,744	103,951	16.7	76.7
Reinforced concrete....................cu. yds.	55	0	49.8	0	90.8
Second-class stone paving..............sq. yds.	110	17	17	15.5	15.5
Cobblestone paving.....................cu. yds.	200	227	227	100	100
Second-class riprap....................cu. yds.	8,140	1,104	1,104	13.6	13.6
24-in. vitrified pipe.....................lin. ft.	200	0	181	0	90.7
Structural steel...........................lbs.	58,000	5,402	35,180	9.3	60.7
Metal in lock-gates........................lbs.	284,000	267,758	268,088	94.3	94.4
Metal in needle-dams.......................lbs.	84,000	55,730	57,313	66.3	68.2
Metal in head-gates........................lbs.	280,000	71,484	111,054	26	40
Metal reinforcement........................lbs.	9,820	3,539	9,838	36.2	100
Steel castings.............................lbs.	7,000	1,925	5,765	27.5	82.4
Iron castings, plain.......................lbs.	128,100	3,396	93,382	2.7	72.9
Iron castings, machined....................lbs.	32,800	0	28,798	0	87.8
Wooden fence..............................lin. ft.	1,000	920	920	92	92
Fender fastenings...........................No.	1,170	32	1,046	2.7	89.4
Sluice-gates, 24″ x 36″ ....No.	2	0.5	1.0	25	50



Barge Canal, Contract No. 14.
Eastern portion of Vischer's Ferry dam under construction.

"*Contract No.* 8. At dam No. 4, lock No. 8, Scotia, a small amount of work has been done during the year by Pittsburg Eastern Co. on the upper guide wall of the lock and at the north span of the dam.

"At dam No. 5, lock No. 9, Rotterdam, the work of building the lock and lower approach wall, together with the north span of the dam, which is adjacent to the lock, was continued until December 24, 1909, when these structures were practically completed. In May, 1910, work was begun on the center span of the dam and on the south shore protection. The following quantities show the volume of work executed at this point: Excavation, 14,000 cu. yds.; embankment, 1,660 cu. yds.; concrete, 6,300 cu. yds.; piles, 1,850; riprap and paving, 4,000 yds.; lumber, 90,000 ft.; embedded metal and metal in gates and needle-beams, 115 tons. The plant used consists of a No. 60 Marion steam-shovel, excavating from borrow-pit, the gravel being washed for concrete, stone crusher and washing and screening plant, three stiff-leg derricks, Lidgerwood cableway, 900 feet long, a steam pile driver, 1½-yd. Hains concrete mixer, one 16-ton Vulcan engine, cars, tracks, pumps, etc.

"At dam No. 6, lock No. 10, Cranesville, the work of building the concrete structure was continued until January 1, 1910, when the foundation of the north span of the movable dam was completed and the entire structures of concrete practically done, except for general clearing up. Steel work has been in progress throughout the entire year. The lock-gates were erected during the winter period of 1909-10. In April, 1910, the erection of the superstructure for the movable dam was again resumed and has been vigorously prosecuted, so that this structure is practically completed, except for the installing of some of the gates for the dam, which have not yet been received. This structure was the first of the Barge canal movable dams to be erected. The following quantities show the volume of work done during the year: Excavation, 2,100 cu. yds.; embankment, 2,660 cu. yds.; concrete, 1,800 cu. yds.; riprap, 1,200 cu. yds.; metal in lock-gates and in movable dams, 600 tons. The plant used consists of two stiff-leg derricks, trains, pumps, steam pile driver, 1½-yard Hains concrete mixer, washing and screening plant, also a small compressor for field riveting, two oil forges, three stiff-leg derricks and erection traveller for steel work.

"On contract No. 8 the average daily force for the construction season was 137 men and 10 teams, working one eight-hour shift; the maximum daily force, 233 men and 16 teams, working one eight-hour shift.

"The following table gives the summary of work done during the year and the total completed to date:

ITEMS OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing.....................lump sum	1	0	1	0	100
Excavation.....................cu. yds.	367,886	19,709	240,076	5.3	65.2
Sheeting and bracing...........ft. B. M.	100,000	25,000	48,700	25	48.7
Embankment...................cu. yds.	69,040	4,317	37,844	6.3	54.8
Sawed lumber (white oak)......ft. B. M.	4,000	1,200	2,400	30	60
Foundation piles, 16 ft. long.........No.	33,000	99	771	3	23.4
Foundation piles, 18 ft. long.........No.	4,100	1,163	2,985	28.3	72.8
Foundation piles, 20 ft. long.........No.	1,100	0	135	0	12.5
Foundation piles, 25 ft. long.........No.	10,852	582	8,901	5.4	82
Foundation piles, 30 ft. long.........No.	350	0	262	0	74.8
Wooden sheet-piling...........ft. B. M.	450,000	79,700	316,100	17.7	70
Second-class concrete*...........cu. yds.	90,000	7,977	58,008	8.9	64.4
Third-class concrete.............cu. yds.	16,000	684	1,060	42.7	66.2
Grouted filling...................cu. yds.	4,200	0	2,774	0	65.9
Ballast (crushed stone, gravel)†...cu. yds.	3,000	549	1,228	18.3	40
Second-class stone paving........sq. yds.	13,950	1,155	3,870	8	27.8
First-class riprap...............cu. yds.	3,990	863	1,680	21.6	42.1
Second-class riprap..............cu. yds.	6,727	1,466	3,025	21.8	45
Third-class riprap...............cu. yds.	700	44	420	6.3	60
Fourth-class riprap..............cu. yds.	10,000	2,638	4,197	26.4	42
Iron castings.........................lbs.	33,000	777	21,358	2.4	64.7
Idlers "A".........................each	100	22	22	22	22
Idlers "B".........................each	12	4	4	33	33
Structural steel.....................lbs.	3,744,000	1,121,000	1,195,100	30	32
Metal reinforcement................lbs.	494,000	92,740	280,117	19	56.7
Pairs of uprights, dam No. 6........pairs	33	10	10	30.3	30.3
Shoes and anchorages..............each	100	31	54	31	54
Upper lock-gates¶..................each	.034	0	.034	0	100
Swing beams for needle-dams.......each	6	1.7	4	28.3	66.7
Needles............................each	186	0	186	0	100
Supports for valve-seats............each	12	0	8	0	66.7
Lock-valves........................each	12	4	8	30.3	66.7
Removing concrete................cu. ft.	360	42	402	11.6	111.6
Upper lock-gates....................each	6	2	3.9	33.3	65
Lower lock-gates...................each	6	2.3	4	37.5	66.7
Emergency piling.................lin. ft.	88,650	6,791	53,240	7.6	60

* Second-class concrete includes crushed stone and gravel concrete of this class. † Ballast includes crushed stone and gravel. ¶ This amount of work done before type of gate was changed, by alteration.

"The work on this residency amounts to $472,000 for the fiscal year. The contractor's average force equals 371 men and 11 teams, working one eight-hour shift. The contractor's maximum force equals 633 men and 18 teams, working one eight-hour shift. The engineering force is: One Resident Engineer, two Assistant Engineers, eighteen assistants and two inspectors."

ERIE CANAL, DREDGING CONTRACTS NOS. 20-B, 20-C AND 20-D.

Resident Engineer E. A. Lamb reports:

"The residency includes contract No. 20-B, extending from Sta. 3872+35, the upper miter-sill of lock No. 16 at Mindenville, to Sta. 3361+85, the upper miter-sill of lock No. 14 at Canajoharie; contract No. 20-C, extending from the upper miter-sill of lock No. 14 at Canajoharie to Sta. 2948+75, the upper miter-sill of lock No. 13 at Yosts; and also contract No. 20-D, extending from the upper miter-sill of lock No. 13 to deep water below the aqueduct at Rexford Flats. The total length of the three contracts is 54.2 miles.

"*Contract No.* 20-B.

"*Surveys.* Surveys and computations have been made for six parcels of land to be appropriated.

"Early in the year the location and grades were given the contractors for test pits to determine the material to be excavated and enable them to select the type of plant to use for the excavation. Base line hubs and range stakes have been set for the river cross-sections between Sta. 3762 and Sta. 3892 and between Sta. 3463 and Sta. 3520.

"Original river cross-sections have been taken between Sta. 3500 and Sta. 3510 and between Stas. 3795 and 3845. Cross-section and grade stakes have been set for the stream entrance work at Klock, Zimmerman and Hough creeks and for the minor stream entrances at Stas. 3852 and 3795, south side of river, and Stas. 3790 and 3759, north side of the river. Surveys of land to be appropriated have been computed and mapped for the following parcels: Salem Snell, Jay Chawgo, H. P. Allen, Failing estate, D. N. Place and N. Y. C. R. R. Co. parcel, which was a released parcel.

"Right-of-way monuments have been set on the following parcels appropriated: H. P. Allen, Maria E. Failing estate, Kate P. Hough, N. Y. C. R. R. Co. (at Hough creek), C. and C. A. Hix, William Allen, N. Y. C. R. R. Co. and Peter Ehle.

"*Construction work.* In September, 1909, the contractors installed a steam plant and drills at Fort Plain on the out-cropping rock on the north side of the river, but within the prism area. Between Stas. 3504 and 3509 the rock has been drilled and blasted, to be removed later by a dredge. From this area about 430 cu. yds. of stone have been hauled to Otsquago creek and about 40 cu. yds. to Caroga creek, to be used for riprap in the stream entrance work. There has also been loaded on cars 1,832 cu. yds. of rock (solid measurement), which was sold to the N. Y. C. R. R. Co.

" The stream entrance work has been completed at Zimmerman and Hough creeks and the minor stream entrances at Stas. 3852 and 3795, south side of the river, and Stas. 3790 and 3759, north side of the river. A pump, derrick and boilers have been placed at Klock creek. The stone has been quarried and delivered, so that work will begin on this stream entrance at once.

" Below Fort Plain on the north side of the river, Stas. 3479 and 3486, the ledge rock is being uncovered, preparatory to drilling and blasting.

"After more or less study and investigation as to the best means of landing the excavated material in spoil, the contractors let a contract for building two dipper-dredges and a hydraulic disposal boat to the Bucyrus Co. of South Milwaukee, Wis. The first material for the hulls arrived the latter part of February.

" The two dipper-dredges are alike, the length of hull being 100 feet, width, 34 feet, and depth at one end, 6 feet, and at the other end, 7 feet, and drawing, when operated, 5 feet of water at the end having a depth of 7 feet. The hull is equipped with one boiler, locomotive type, about 150-horse-power, 20 feet long and 5 feet 6 inches in diameter, one main engine of sufficient power to operate a 5-cu. yd. dipper in soft clay or sand, one engine for capstans, one engine for swinging circle 18 feet in diameter, one shipper engine on boom, which boom is equipped with 3-cu. yd. dipper.

" For conveying the dredged material to spoil bank a hydraulic disposal boat, with 20-inch dredging pump, is designed to receive the material from the dipper-dredge directly into a hopper, whence it is fed into a revolving screen. The material passing through the screen drops into a sump, which is connected with the suction pipe line. The material rejected by the screen is discharged into a skip and is conveyed to a rock scow alongside, from which it is placed in spoil by another dredge.

"The disposal boat is equipped with one centrifugal dredging pump, with 20-inch suction and discharge, made of nickel steel, directly connected to a vertical marine type, triple expansion engine, having cylinders 15, 22 and 36 inches in diameter by 18 inches long, with the usual condensers, feed water heaters, etc. The engine has a rated horse-power of 750 and is suitable for 200 pounds pressure. The diameter of both suction and discharge pipe is 20 inches. The revolving screen is 6 feet in diameter and 22 feet 8¾ inches long with perforations 7½ inches square. This screen is mounted on four friction rollers, two of which are used to drive it. The hopper is lined with steel wearing plates and provided with a mechanical arrangement to keep it constantly in motion, or shaken. A separate engine is installed for this purpose. In addition, to prevent clogging the hopper and chute, jets of water are provided to wash the finer material into and through the screen. A separate, 12-inch, two stage, centrifugal pump is used for this purpose.

"Three boilers of locomotive type, with a combined heating surface of 5,000 sq. ft., 72 inches in diameter and 22 feet long, designed for a working pressure of 200 pounds per square inch, are placed near the middle of the hull, which hull is 110 feet long and 38 feet wide, with 8 by 12-inch floor beams and stern and sides covered with 6-inch planking. The boat is equipped with a separate electric light plant.

"The size of the hopper, etc., is designed to take care of at least four full dippers every three minutes. The pumping plant is able to discharge the material 28 feet above the water level 1,600 feet from the point of excavation, provided the angle at any point in the discharge pipe does not exceed 20 degrees, and also is able to discharge material 2,400 feet from the point of excavation and 5 feet above the water level.

"The dipper-dredges are completed and it is expected that the hydraulic disposal boat will be operating in a few days.

"An orange-peel dredge with a 2-cu. yd. bucket has been completed. This dredge is 70 feet long, 35 feet wide and 4 feet 6 inches deep, with 60-foot boom equipped with one main engine and one swinging engine.

"The hull for the Lobnitz rock breaker has been built ready to launch and all its machinery delivered. This hull is 100 feet long, 28 feet wide and 6 feet deep. There has also been completed one rock scow, 90 feet long, 35 feet wide and 5 feet deep, and four coal and rock scows, 50 feet long, 13 feet wide and 4 feet 6 inches deep; a house boat 38 feet long and 32 feet wide, having two floors, capable of accommodating 40 men, and a tug-boat with 50-horse-power engine, 50 feet long, 13 feet wide and 4 feet 6 inches deep.

"The remaining plant on this contract consists of one 10-ton crane with 1⅓-cu. yd. orange-peel bucket, 1 stiff-leg derrick with ¾-yd. orange-peel bucket, two boilers for steam drill, a quantity of steam drills, drill steel and small tools, together with an extensive machine shop, stores, office, etc. The actual cost of the contractor's plant exceeds a quarter of a million dollars.

"Until August 1, 1910, the engineering work on this contract was done by a party under Mr. A. G. Austin, Assistant Engineer, who from the start has been in charge of contract No. 20-C, with office at Canajoharie. In August, 1910, a field office was opened in St. Johnsville and Mr. L. H. M. Whitney, Leveler, with one Rodman and one Chainman as assistants, has had charge under Mr. Austin.

"*Contract* No. 20-C.

"*Surveys.* The location and grades for eight test pits were given. Base line hubs and range stakes for river cross-sections have been set from Sta. 3259 to Sta. 3357, also lines and grades and cross-sections taken for the stream entrance work at Canajoharie creek and the streams at Sta. 3309 and Sta. 3269. River cross-sections have been taken from Sta. 3330 to Sta. 3342.

"Thirteen parcels of land to be appropriated have been computed and mapped from surveys previously made. Nine other parcels have been surveyed, computed and mapped. Two others have been surveyed, but not mapped. Surveys have also been made and descriptions written of nine parcels of land to be used for spoil areas, the release having been executed.

"*Construction work.* In April, 1910, the Mohawk Valley Machine Co., contractors, began the erection of a large machine shop at Canajoharie.

"In July the contractors executed a contract with the Mohawk Engineering and Construction Co. to do their stream entrance work on the contract, except the work in Canajoharie creek. After the contractors excavated about 1,100 cu. yds. from the stream entrances at Stas. 3309 and 3269, they abandoned the work.

"About 14,000 cu. yds. of excavation has been removed from the Canajoharie creek and the prism opposite the mouth of the creek. About 6,400 feet of dikes from 6 to 10 feet high have been built in the vicinity of Canajoharie.

"The contractors began the construction of the hulls for one dipper-dredge and one hydraulic dredge the first week in April. The dipper-dredge, now in operation, is 95 feet long, 36 feet wide, draws about 5 feet of water and is equipped with a 2½-cu. yd. dipper and with sufficient power to operate in very hard material. The hull was built by the Mohawk Valley Machine Co. and the machinery furnished and installed by the Marion Steam Shovel Co.

"The hull for the hydraulic dredge was built by the Mohawk Valley Machine Co. and the machinery was furnished and installed by the Morris Machine Works. The hull is 138 feet long, 40 feet wide and draws from 4 to 5 feet of water. The pump is a 20-inch suction and discharge and is directly connected to a vertical marine type, triple expansion engine, having cylinders 15, 22½ and 36 inches in diameter, with condenser and feed water heaters. The estimated horse-power is 750. The cutter engine is 100 horse-power (developed) and the spud engine, 75 horse-power (developed). The steam is furnished by four water-tube boilers, each of 180 horse-power, but with the forced draft system from 30 to 40 per cent increased horse-power can be effected. The ladder is framed of structural steel, with cutter shaft 8 inches in diameter. The cutter is 7 feet, outside diameter, 4½ feet in length and makes 12 revolutions per minute. Both dredges are equipped with electric lighting plants.

"The hydraulic dredge will be ready to operate within a month. One dump scow, 95 feet long, 17 feet wide, with a draft of from 4 to 5 feet, having four pockets with a total capacity of 125 cu. yds., has been completed and another started, also one coal scow, 65 feet long, 17 feet wide and 4½ feet high and a stone boat or scow 26 feet long, 14 feet wide and 3 feet high, have been built. The remaining plant now on the work consists of a Page bucket excavator, 1¼-cu. yd. capacity, with boom 65 feet long, and engine and boiler of 50 horse-power, two contractors' locomotives with a number of cars, a New Era grader and a tug-boat, 55 feet long, 16 feet beam and 5 feet draft, with 12 by 16-inch engine and boiler of 200 pounds steam pressure.

"Mr. A. G. Austin with party and office at Canajoharie has had charge of the work on this contract.

"*Contract No.* 20-D.

"*Surveys.* Early in January, 1910, there being no base line shown on the letting plans, all the available data concerning the base line topography used to prepare the original maps was collected and a field party organized to establish a working base line to be used for construction work. Where convenient, the old base line was used. Standard concrete monuments were put in at all angle points, where old monuments were not found. Both the old and new monuments are all referenced and recorded, including a sketch for each monument.

"Beginning at the aqueduct, the working line runs along the Erie canal tow-path 4,300 feet, then crosses the river. In this 4,300 feet it was convenient to use one old monument and necessary to put in 6 new ones. On the north side of the river the line runs as close as possible to the river bank as far as the Scotia bridge. Two old monuments and 19 new ones were set. From the north end of the Scotia bridge the line cross along the east side of the bridge to a copper bolt put in the coping of the retaining wall near the toll house. Two new monuments were set on the east side of the Benne kill and then the line crosses the Benne kill onto the Van Slyk island, along the north side of the island and crosses to the main line at the west end of the island and along the south side of the river and to the tow-path a short distance west of the Schenectady water works. Eleven new monuments were set between Scotia bridge and the Schenectady water works. At this point, we used the old monumented base line all the way to the end of Section No. 2, but found it necessary to put in on this base line about 10 new monuments.

"The new monuments are placed where deflection angles were used and the distance computed across curves in the river and towpath for the old base line.

"Between the west end of Section No. 2 and the curve in the river east of the New York Central cross-over bridge below Hoffmans Ferry, a new monumented working line has been put in on the north bank of the river. This was thought best on account of the center line of the canal being much nearer the north bank of the river and also on account of islands in the river between these points. Also a monumented line on the north side of the river, beginning about one-half mile below lock No. 9 and extending west nearly a mile, was put in. This was done because the lock and the center line of the canal are nearest the north bank.

"This makes a total of 72 new monuments and 72 old monuments. The field work has been completed. The lines, ranges and normal distances from the center line are all computed, plotted and checked and the computing and checking has again been rechecked by Mr. T. S. Bailey, except about 6 miles at the west end.

"A copy of the notes for the State Engineer's office is ready to deliver as soon as Mr. Bailey is through with his rechecking. Points on every bridge, where the Barge canal center line crosses it, have been established, marked and referenced.

"Mr. James B. Maguire, Assistant Engineer, was in charge of the work up to July 1, 1910. Mr. L. H. M. Whitney was his assistant, or instrument man, and took charge of the work from July 1, to August 1, 1910. One, and part of the time, two chainmen and a laborer constituted the remainder of the field party. A working base line with ranges, etc., has been established from the center line of the bridge at Sta. 2435 + of the movable dam at Tribes Hill along the north side of the river to the end of the prism excavation at Sta. 2460 (for some distance up the river). Original cross-sections have been taken from this base line and grades and lines for the excavation and the construction of the dike at Tribes Hill have been given.

"*Construction work.* In July, 1910, the contractors executed a contract with the Mohawk Engineering and Construction Co. to do the stream entrance work and the rock excavation above the lock at Tribes Hill and to build the concrete dike.

"A coffer-dam to include the concrete dike and the prism excavation from the end of the lock to Sta. 2451 was built and the drilling of the ledge rock was only begun when a rise of the water in the river on September 28 broke the coffer-dam and washed out three sections, ranging in length from 75 to 125 feet.

" No field office has been established on this contract, the field party using temporarily one room of the residency office, Residency No. 2, at Schenectady, also residency office at Amsterdam, and the office at Tribes Hill, contract 17, field office. Mr. T. S. Bailey, Leveler, has had charge of the work at Tribes Hill.

"*Office Work.*

" The residency office has continued in the old Guy Park House at Amsterdam, appropriated by the State for construction purposes.

" In this office appropriations have been plotted on the egg-shell maps and tracings and descriptions printed for appropriations on contract No. 20-C, as follows:

" Frederick and Augustus Jones; Cordelia Taylor (3 parcels); W. M. H. Grimshaw; Daniel Shaper; Empire Equipment Co.; N. Y. C. R. R. Co. (2 parcels); Bridget Lee; Hannetta Lussa (2 parcels); Florence M. Keck (2 parcels); Adam Schlotzhauer (3 parcels); Frederick Minister; Peter Lipe; Town of Canajoharie; Chas. Paulfus (2 parcels); Emma S. Countryman, and George Kelly estate.

" Appropriations traced in this office on contract No. 20-B are as follows:

" Salem Snell; Jay Chawgo; H. P. Allen; Failing estate, and D. N. Place.

" The following working drawings have been traced in this office from the egg-shell maps for engineers in the field:

" Contract No. 20-B: All of the contract (17 sheets, 24″ x 36″).

" Contract No. 20-C: All of the contract (14 sheets, 24″ x 36″).

" Contract No. 20-D: Yosts to lock 27, end of residency No. 3 (29 sheets, 24″ x 36″)."

ERIE CANAL, RESIDENCY NO. 3.

Resident Engineer F. P. Williams reports:

" The limits of the residency are old lock 27 near Cranesville at the east end, and old lock 34 near Mindenville at the west end, covering a length of 34.4 miles along the Mohawk river. This report is of preliminary work executed on the above residency and also on contract 17 and that portion of contract 14 lying within the above limits.

"*Surveys.* A survey was made of one parcel of appropriated lands at Fort Plain. Current-meter readings were taken during the spring at high and low-water stages at Amsterdam, Fonda and Fort Plain, to ascertain the discharge of the Mohawk river at these points. Standard bench marks were provided and permanently established on structures founded on rock at Amsterdam, Tribes Hill, Canajoharie and Fort Plain. A survey and cross-sections of the State dam across the Schoharie creek have been made, and cross-sections have been taken and borings made at proposed sub-station power-house sites on contracts Nos. 17 and 14, section 3.

"The engineering necessary for the construction work at the five different locks and dams on the residency has been done as far as the work of the contractors has required and measurements taken each month for estimates. Gage readings have been taken each Friday at Amsterdam and at St. Johnsville.

"*Office work.* Work on the final estimates has progressed during the year as follows: On contract 17, estimate of work done by Scofield Co. and Department of Public Works has been prepared in final estimate form; for dam 7 and lock 11, the estimate has been completed, except for middle span of dam and bridge superstructure; the estimate for dam 8 and lock 12, is practically completed, except for bridge superstructure; on contract 14, sundry sheets have been prepared for dam 9, lock 13, at Yosts, and dam 10, lock 14, at Canajoharie; for dam 11, lock 15, at Fort Plain, estimates for all the concrete have been made; estimate for Mindenville retaining dam is completed.

"Complete reports and computations of flood discharges of the Mohawk river have been made. Report on one Court of Claims case was prepared and reports on five claims filed with First Resident Engineer. Plans and bills of material for timber flooring of bridges on contract 17 have been made.

"By direction of the Division Engineer, I have been assigned to take charge of Residency No. 1, Champlain canal, with headquarters at Mechanicville, the first part of October, 1910. I am succeeded by Mr. A. E. Steere, Resident Engineer, who assumes charge of Residency No. 3, Erie canal, on October 6, 1910.

"*Contract No.* 17. On this work, which includes the construction of dam 7 and lock 11 at Amsterdam and the construction of dam 8 and lock 12 at Tribes Hill, the contractor, Alexander Murdoch, has advanced the work steadily and completed the following:

"At dam 7, lock 11, at Amsterdam: Rivetting and painting of lock gates have been completed and gates have been swung. Needle-beams are swung and lower lock-valves placed. The erection of steel bridge, which was commenced in May, 1910, has been practically completed and about 50 per cent rivetted. In the middle span of dam, a small amount of excavation has been done and concrete placed. With the construction of the middle span of dam and the completion of the rivetting and painting of the bridge, work at this point will practically be completed. The engineering work has been in charge of Mr. M. E. James, Assistant Engineer, and party, at Amsterdam.

"At dam 8, lock 12, at Tribes Hill: The lock, which was in progress of construction at the time of last year's report, and the north span of dam have been completed. It is a matter of record that the construction of this lock was done in one season's work. Backfilling of the lock and guide walls has been completed and wash wall laid. Upper and lower lock-gates have been rivetted and painted and are ready for swinging. The needle-beams and lock-valves for both ends of lock have been placed. The erection of false work for bridge from both north and south ends has been commenced. The approach span girders have been erected. The work at this point is practically complete, except for the completion of the bridge superstructure. The engineering work at this site has been in charge of Mr. A. E. Steere, Assistant Engineer, and party, with office at Tribes Hill.

"General remarks, contract No. 17: The contractor has employed extension coffer-dams, a dozen pumps, one steam-shovel, derricks of several types, pile drivers, dinkys, cars, a cableway and two crushing and mixing plants, steam-drills, compressor plant, travelling derricks, etc., in progressing the work. About 70 per cent of the contract work has been completed to date. The average daily force employed by the contractor at both sites during the working season numbered about 160 men.

"The following table shows the items of work done, the percentage of work completed to date, etc., on this contract.

ITEMS OF WORK.	Preliminary estimate as affected by alterations.	Done during year by Alex. Murdoch.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing....................lump sum	....	....	80%	0	80
All excavation....................cu. yds.	185,336	13,952	141,683	7	76
Drilling bolt holes in rock..........lin. ft.	150	0	100	0	Finished
Sheeting and bracing............ft. B. M.	100,000	1,907	75,756	1.9	75.7
Forming embankment............cu. yds.	33,000	733	18,721	2.2	56.7
Puddle..........................cu. yds.	225	0	156	0	Finished
Sawed lumber, white oak........ft. B. M.	3,000	588	1,836	19.6	61.2
Foundation piles, 15 ft. long..........No.	547	0	495	0	Finished
Foundation piles, 16 ft. long..........No.	1,100	0	931	0	Finished
Foundation piles, 20 ft. long..........No.	500	0	342	0	Finished
Steel sheet-piling....................sq. ft.	700	0	573	0	Finished
Wooden sheet-piling.............ft. B. M.	75,000	0	58,418	0	77.9
Second-class concrete............cu. yds.	49,977	7,789	45,253	15.6	90.5
Third-class concrete.............cu. yds.	1,794	0	1,037	0	57.8
Wash wall.......................cu. yds.	7,000	4,839	4,895	69.1	69.9
Ballast..........................cu. yds.	1,021	31	664	3	65
Hand-laid riprap.................cu. yds.	4,200	0	3,594	0	Finished
First-class riprap................cu. yds.	4,300	779	3,566	18.1	82.9
Second-class riprap..............cu. yds.	5,300	624	4,129	11.8	77.9
Fourth-class riprap..............cu. yds.	4,310	304	3,350	7	77.7
Iron castings.........................lbs.	25,000	3,542	21,493	14.2	86
Structural steel......................lbs.	2,617,000	1,258,596	1,295,505	48.1	49.5
Metal reinforcement.................lbs.	182,247	9,465	156,782	5.2	86
Cast iron idlers "A"..................No.	70	38	38	54.3	54.3
Cast iron idlers "B"..................No.	8	4	4	50	50
Cast iron shoes, dam 7...............No.	38	0	24	0	63.2
Cast iron shoes, dam 8...............No.	32	16	32	50	Finished
Wrought iron chains.................lbs.	141,000	31,562	31,562	22.4	22.4
Valve-seat supports.................No.	8	2	8	25	Finished
Lock-valves, etc.....................No.	8	5.9	5.9	73.7	73.7
Upper lock-gates.....................No.	4	3.262	3.48	81.5	87
Lower lock-gates.....................No.	4	3.72	3.93	93	98.2
Needle-dams, complete...............No.	4	3.429	3.88	85.7	97

"*Contract No.* 14, *Section* 3. On this work, which includes the construction of dam 9 and lock 13 at Yosts, the construction of dam 10 and lock 14 at Canajoharie, the construction of dam 11 and lock 15 at Fort Plain, and the construction of retaining dam at Mindenville, the contractors, Acme Engineering and Contracting Co., have advanced the work rapidly during the year, as follows:

"At dam 9, lock 13, at Yosts: In the fall of 1909 the south span of dam and the river pier, except for the upper lift, were constructed. During the present season the flooring of the lock and the river wall, which were in progress of construction at the time of last year's report, have been completed. The coffer-dam to enclose the north span of dam has been completed and preparations made for pumping out. Work on riprap is in progress on the north bank. The contractor has employed a hydraulic dredge for excavating and pumping, also three large travelling derricks and extensive washing and mixing plant, cableway, cars, pumps and sundry smaller plant in progressing the work. The engineering work has been in charge of Mr. E. D. Hendricks, Assistant Engineer, and party, at field office on the site.

"At dam 10, lock 14, at Canajoharie: In the fall of 1909 the concrete in the land wall of the lock and in the north abutment and north span of dam was completed. During the present season the river wall of the lock has been completed and the work in the south span has steadily advanced, although somewhat retarded by leaks in the coffer-dam, caused by high-water conditions of the river. About two-thirds of the concrete in the upper guide wall has been completed, half of the foundation piles for this wall having been driven in the fall of 1909. Preparations for constructing the north bank protection and excavating for south abutment are in progress. The upper and lower lock-gates have been assembled and the steel for the bridge superstructure is being unloaded at the site. A trestle across the river was constructed by the contractors in the spring to carry one track. The contractors have employed Page buckets, dinkys and cars, several derricks, a concrete mixing plant, pumps, etc., in progressing the work. The engineering work has been in charge of Mr. Lewis Bartlett, Assistant Engineer, and party, with office at Canajoharie.

"At dam 11, lock 15, at Fort Plain: The south span of dam and river pier were finished in the fall of 1909. The erection of the steel bridge, with the exception of the north cantilever end, has been finished and about 50 per cent of rivets driven. With the completion of the bridge, the work at this point will be practically completed. The dike at the west end of the site was constructed during the present season. In executing their work for the year, the contractors have employed a cableway, derricks, dinkys, cars, pumps, etc., and for the steel work, travelling derricks, a compressor plant and sundry smaller plant. The engineering work at this site has been in charge of Mr. Lewis Bartlett, Assistant Engineer, and party, with office at Fort Plain.

"At Mindenville retaining dam: As noted in last year's report, the work at the Mindenville retaining dam had been practically completed under the direction of Mr. E. P. Neuschwander, Assistant Engineer.

"General remarks, contract 14, section 3: The average daily force on the three working jobs of this contract during the working season was about 260 men. The river and weather conditions have been generally favorable for river work during the past year.

"General residency remarks: The residency office has been continued in the old Guy Park House at Amsterdam, appropriated by the State for construction purposes.

"The following table shows the amount of work done on that portion of contract No. 14 within Residency No. 3:

ITEMS OF WORK.		Preliminary estimate as affected by alterations.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing	lump sum	$50	0	80%	0	80
All excavation	cu. yds.	423,165	49,665	267,264	12	63
Sheeting and bracing	ft. B. M.	83,412	34,726	81,460	42	98
Forming embankment	cu. yds.	65,877	18,202	32,862	28	50
Sawed lumber, yellow pine	ft. B. M.	115,890	0	27,615	0	24
Sawed lumber, hemlock	ft. B. M.	64,962	0	49,094	0	76
White oak in miter-sills and gates	ft. B. M.	35,100	5,557	5,557	16	16
Sawed lumber, white oak	ft. B. M.	7,000	0	6,155	0	87
Stone filling in cribs	cu. yds.	1,400	0	1,181	0	84
Foundation piles, 10 ft. long	No.	70	0	37	0	53
Foundation piles, 12 ft. long	No.	118	41	41	35	35
Foundation piles, 14 ft. long	No.	1,500	19	38	1	2
Foundation piles, 16 ft. long	No.	2,562	748	1,469	29	57
Foundation piles, 20 ft. long*	No.	....	97	193	....	....
Wooden sheet piling	ft. B. M.	115,270	24,960	63,456	22	55
Second-class concrete	cu. yds.	75,199	23,409	58,788	31	78
Third-class concrete	cu. yds.	1,280	20	492	2	39
Second-class stone paving	sq. yds.	3,577	633	753	18	21
Third-class stone paving	sq. yds	460	133	175	29	38
Ballast	cu. yds	2,263	199	593	8	26
First-class riprap	cu. yds	2,847	1,061	1,344	37	47
Second-class riprap	cu. yds.	7,460	2,459	3,989	33	53
Third-class riprap	cu. yds.	942	251	338	27	36
Fourth-class riprap	cu. yds.	8,607	1,654	3,854	19	44
Structural steel	lbs.	2,526,966	756,956	776,179	30	31
Metal in lock-gates	lbs.	566,400	32,652	170,871	6	30
Metal in needle-dams	lbs.	246,000	57,065	112,115	23	45
Metal reinforcement	lbs.	198,769	65,267	108,302	33	55
Iron castings, plain	lbs.	34,900	9,663	21,478	28	62
Iron castings, machined	lbs.	22,200	8,083	19,425	36	87
Cast iron shoes for uprights	lbs.	86,000	16,808	54,516	19	63
Wrought iron chains	lbs.	148,000	41,295	41,295	28	28

* Substituted for 16 ft.

ERIE CANAL, RESIDENCY NO. 4.

Resident Engineer Philip H. Dater reports:

"Residency No. 4 of the Erie canal extends from a point 2,400 feet east of lock No. 34 of the present canal at Mindenville, Montgomery county, to the division line between contracts No. 30 and

No. 29, near Sterling creek, and 4 miles east of the easterly boundary of the city of Utica. Contract No. 29, which extends westward to the city line of Utica and which was formerly a part of Residency No. 4, has recently been made a part of Residency No. 4-A. The total length of the Barge canal within the limits of Residency No. 4 is 23.8 miles.

"For the purpose of construction the work on this residency is divided into the following contracts, all of which are let:

"Contract No. 18. Land line from one-half mile east of Mindenville to Indian Castle. Length 3.63 miles. Contract price, $859,460.

"Contract No. 20-A. Land line and dredging from Indian Castle to Little Falls. Length 4.5 miles. Contract price, $490,592.50.

"Contract No. 31. Land line through Little Falls. Length 1.01 miles. Contract price, $829,770.43.

"Contract No. 30. Land line and dredging from Little Falls to Sterling creek. Length 14.62 miles. Contract price, $2,591,666.50.

"Contract No. 13. Superstructures for two bridges on contract No. 18 are included in this contract. Contract price for the two bridges on Residency No. 4, $12,303.50.

"The above contracts include all the main work to be done on this residency. The following remains to be put under contract: On contract No. 20-A, a bridge near Rocky Rift dam; on contract No. 31, the removal of the existing locks and the building of one lift and one fixed bridge; on contracts Nos. 18, 31 and 30, machinery for operating locks. Due to the recent abandonment, by agreement between the contractors and the State, of all work on contract No. 18, it will be necessary to relet this contract for the completion of the prism work.

"The following statements show the progress made on construction work for the various contracts on the residency:

"*Contract No.* 18. This contract begins at the eastern end of the residency and provides for the construction of lock No. 16 at Mindenville, a retaining dam and substructure for the guard-gate at Indian Castle, substructures for two highway bridges, 3.63 miles of standard land line, a temporary canal around lock No.

16 and various incidental structures. The contract was let on December 28, 1906, to the O'Brien & Hoolihan Contracting Co. of Syracuse, N. Y. The work was begun on January 31, 1907. In March, 1910, the name of the contractors was changed by Court order to Kelley Bros. Contracting Co. The main office of the contractors remains at Syracuse. During the year ending September 30, 1910, the following work has been done:

"At lock No. 16, the gates, needle-beams, valves, etc., have been erected. The lock is now completed, except for the machinery, which is not included in this contract.

"The excavation by dredge and building embankment from Sta. 3994 to Sta. 4020 were in progress until January. Prism excavation by steam-shovel between Sta. 3919 and Sta. 3945 was in progress from December to February. Additional prism excavation was made from Sta. 3891 to Sta. 3919. All structures on the contract are completed, except the dive culvert at Sta. 4027, on which no work has been done. The 48-inch cast iron pipe for this culvet has been delivered. The construction of the temporary timber locks at Sta. 3982 near East Canada creek under an extra work order was done at the close of navigation. As it was not considered possible to complete the prism excavation between Sta. 3951 and these locks to an extent deemed necessary for the operation of the old canal, the construction of the locks and all other contract work was abandoned in February in accordance with an agreement between the contractors and the State. Since this date, only such work has been done as was necessary for the operation of the old canal, the providing for safe highway crossings and finishing up such contract work as was nearly completed. An alteration (No. 8) has been provided for eliminating all remaining work on the contract. The contractors agree to bring no claims and the State consents to making final payment for the work done. The work on this contract is now 53.3 per cent completed.

"The engineering work on this contract in connection with construction work and the preparation of alteration No. 8 and the final estimate has been in charge of Mr. E. E. Kendall, Assistant Engineer.

" The following summary shows the amount of work put under contract and the amount done up to September 30, 1910, including the alterations in force and the extra work orders:

ITEMS OF WORK.	Preliminary estimate.	Preliminary estimate, including alterations to date.	Work done during year	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing....................lump sum	$500	$500	0	$400	0	80
Grubbing....................cu. yds.	26,000	24,400	1,026	11,558	4.2	47.4
All excavation................cu. yds.	937,000	944,970	73,877	446,925	7.8	47.3
Forming embankment.........cu. yds.	500,000	519,620	11,877	170,396	2.3	32.8
Lining.......................cu. yds.	2,000	2,490	895	1,215	35.9	48.8
Sawed lumber...............ft. B. M.	15,000	1,700	1,082	1,082	63.7	63.7
White oak in miter-sills......ft. B. M.	2,000	2,000	1,185	1,185	59.3	59.3
Sheeting and bracing........ft. B. M.	10,000	50,000	0	22,800	0	45.5
Foundation piles, 13 ft. long.......No.	120	120	0	108	0	90
Foundation piles, 20 ft. long.......No.	140	140	28	132	20	94.3
Second-class concrete (crushed stone) cu. yds.	30,000	21,979	4	22,388	0.0002	101.8
Reinforced concrete...........cu. yds.	500	491	68	446	13.8	90.9
Grouted filling...............cu. yds.	950	0	0	0	0	0
First-class masonry coping.....cu. yds.	5	5	2.4	2.4	48.1	48.1
Wash wall...................cu. yds.	30,000	30,470	0	0	0	0
Cobblestone paving...........sq. yds.	50	50	55	55	110	110
Ballast......................cu. yds.	100	100	0	90	0	90
Third-class riprap............cu. yds.	150	150	0	0	0	0
Fourth-class riprap...........cu. yds.	2,500	2,605	0	549	0	21
Structural steel..................lbs.	24,000	13,460	912	15,344	0.07	114
Metal reinforcement..............lbs.	73,500	56,094	6,866	36,703	12.2	65.4
Cast iron pipe, laid..............lbs.	343,000	343,000	0	0	0	0
Steel castings....................lbs.	4,000	4,000	0	3,650	0	91
Iron castings, plain..............lbs.	16,500	14,830	0	14,508	0	98
Iron castings, machined..........lbs.	9,000	9,000	0	8,150	0	90.5
Wooden fencing...............lin. ft.	3,500	3,948	269	269	6.8	6.8
Upper lock-gates.................No.	2	2	1.85	1.94	92.6	97
Lower lock-gates.................No.	2	2	1.885	1.98	94.2	99
Upper needle-dam................No.	1	1	0.91	0.98	91	98
Lower needle-dam................No.	1	1	0.92	0.98	92	98
Lock-valves......................No.	4	4	3.584	3.944	89.7	98.7
Removal of bridge superstructures..No.	11	11	0	8.5	0	77
Maintaining traffic.........lump sum	$2,000	$2,000	$1,000	$1,800	50	90
Deduct for building removed..lump sum	$3,000	$3,000	0	$3,000	0	100
Deduct for sheeting and bracing previously used............ft. B. M.	0	10,343	0	10,343	0	100
Second-class concrete in place of grouted filling....................cu. yds.	0	950	0	894	0	100
Second-class gravel concrete...cu. yds.	0	6,179	925	2,060	14.9	33.4
Extra Work.						
Lining temporary canal.......cu. yds.	....	....	0	252	0	100
Steel sheet-piling..............sq. ft	....	....	0	8,000	0	100
Preparing of 200 sand bags............	....	....	0	$32	0	100
Lining temporary tow-path....cu. yds.	....	....	0	1,000	0	100
Widening approach, temporary canal cu. yds.	....	....	0	2,172	0	100
Laying pipe to drain water from cellars	....	....	0	$1,144	0	100
Building temporary locks near Mindenville..............................	$32,250	$7,408	$7,408	$7,408	100	100

" *Contract No.* 13. The contract includes in part the superstructures for two highway bridges on contract No. 18. The contract was let on November 7, 1908, to the Penn Bridge Co. of Beaver Falls, Pa. During the past year both these bridges have been completed, except laying the floor of the bridge at Sta. 3951. Due to the abandoning of the work on contract No. 18, this bridge can not be put in use, as the north approach has not been built. The portion of this contract on Residency No. 4 is 90.2 per cent completed.

" The following summary shows the amount of work put under contract and the amount done up to September 30, 1910:

ITEMS OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
On Contract No. 18.					
Structural steel .... lbs.	210,000	207,180	207,180	98.7	98.7
Sawed lumber, yellow pine or Douglas fir. ft. B.M.	5,000	2,000	2,000	40	40
Wooden pavement .... sq. yds.	550	262.5	262.5	47.7	47.7
Setting stone coping .... cu. yds.	4	2.4	2.4	60	60
Lining .... cu. yds.	4	2	2	50	50

" *Contract No.* 20-A. This contract begins at the western end of contract No. 18 and extends to the east end of contract No. 31, at Little Falls. The work includes 0.7 mile of land line at the eastern end and 3.8 miles of dredging in the Mohawk river between Rocky Rift dam and Little Falls. The contract was let on August 20, 1909, to Houston Barnard of Rochester, N. Y. Prism excavation has been under way since May, between Sta. 4062 and Sta. 4091. The progress has been slow. The work is 8.5 per cent completed.

" The engineering work on this contract is in charge of Mr. E. E. Kendall, Assistant Engineer.

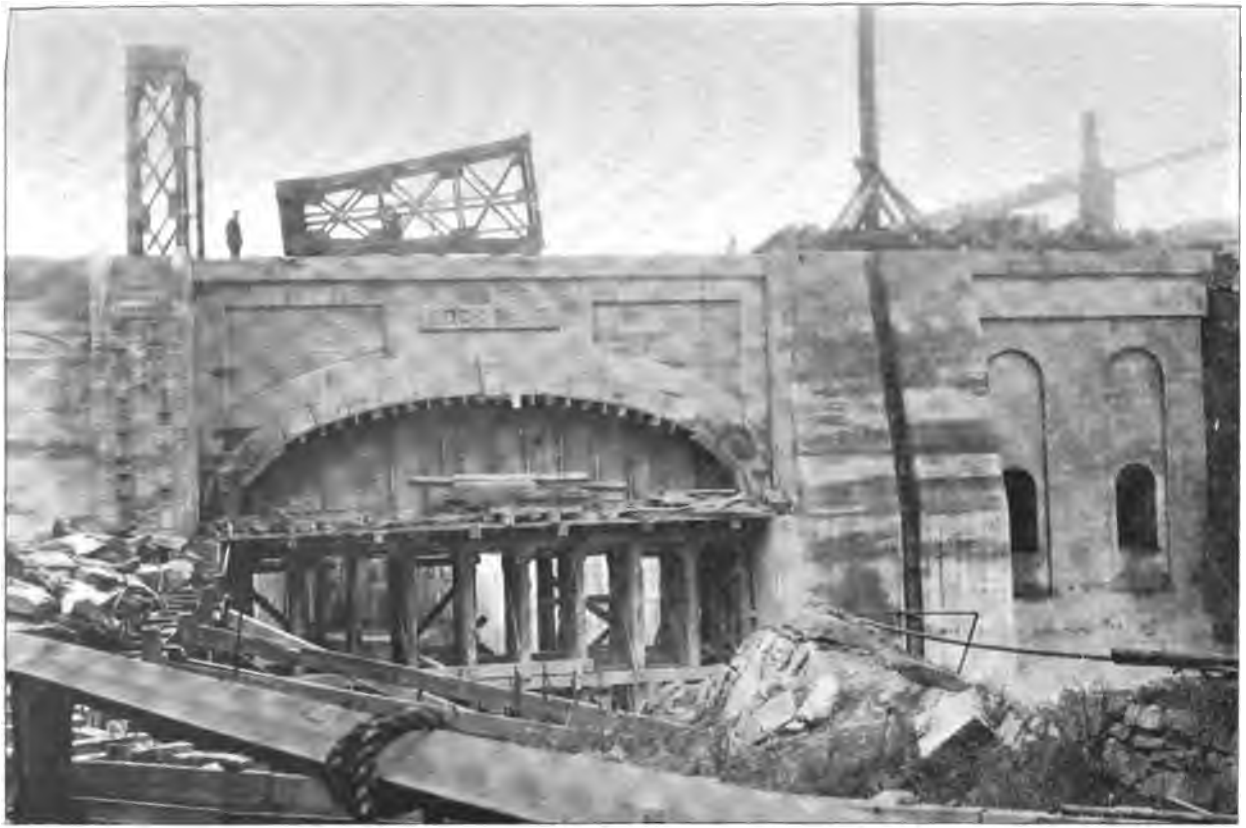
" The following summary shows the amount of work put under contract and the amount done up to September 30, 1910, including the alteration in force:

ITEMS OF WORK.	Preliminary estimate.	Preliminary estimate, including alterations to date.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing .... lump sum	$120	$120	0	0	0	0
Grubbing .... cu. yds.	500	500	259	259	51.8	51.8
Excavation .... cu. yds.	588,000	588,000	52,026	52,026	8.8	8.8
Sheeting and bracing ...... ft. B. M.	4,000	4,000	0	0	0	0
Round timber bracing .... lin. ft.	250	250	0	0	0	0
Forming embankment .... cu. yds.	7,500	7,500	0	0	0	0
Lining .... cu. yds.	100	100	0	0	0	0
Wash wall .... cu. yds.	6,000	6,000	0	0	0	0
First-class riprap .... cu. yds.	100	100	0	0	0	0
Second-class riprap .... cu. yds.	200	200	0	0	0	0
Third-class riprap .... cu. yds.	300	300	0	0	0	0
Fourth-class riprap .... cu. yds.	500	500	0	0	0	0

"*Contract No.* 31. This contract provides for the construction of lock No. 17, guard-gate, bridge, retaining walls and one mile of land line through the city of Little Falls and for the construction of a movable crest on the Rocky Rift dam and the superstructure of the Indian Castle guard-gate. This contract was let on September 2, 1908, to Casey & Murray of Rochester, N. Y. The work was begun on September 12, 1908.

"At lock No. 17 during the past year the chamber excavation has been completed and the north wall and the arch beam across the lower end of the lock have been built. This lock is practically completed, except the erection of the steel work, all the materials for which are on the site of the work. Prism excavation has been in progress from Sta. 4299 to Sta. 4305, from Sta. 4311 to Sta. 4315 and from Sta. 4323 to the western end of the contract. About one-half of the excavation for the guard-gate near the western end of the contract has been made. In addition to the concrete work, which has been done at lock No. 17, a retaining wall has been constructed along the north side of the canal near Sta. 4310 and also near old lock No. 39.

" Previous to the opening of navigaton in the spring of 1910, the north half of the old canal along the new retaining wall from Sta. 4316 to Sta. 4322, at old lock No. 38, was repuddled and covered with a stone protection. There has been no leakage



Barge Canal, Contract No. 31.

View from just below lower gate of Little Falls lock — the highest lift lock ever built. Towers for lift gate are shown.

since this work was done. The percentage of work done is 57.2, which is 5 per cent ahead of the elapsed time. The work remaining to be done is mostly prism excavation west of old lock No. 38. It is hoped that this contract will be completed by next summer.

"The engineering work on this contract was in charge of Mr. Frederick W. Harris, Assistant Engineer, up to May, 1910, since which date Mr. E. E. Kendall has been in charge.

"The following summary shows the amount of work put under contract and the amount done up to September 30, 1910, including the alterations in force and extra work orders:

ITEMS OF WORK.		Preliminary estimate, including alterations to date.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing	lump sum	$100	$50	$100	50	100
Excavation	cu. yds.	243,498	51,589	141,488	21.2	58.1
Removal of dam masonry	cu. yds.	250	0	0	0	0
Round bracing	lin. ft.	1,000	0	0	0	0
Sheeting and bracing	ft. B. M.	30,000	0	0	0	0
Channeling	sq. ft.	43,000	0	0	0	0
Embankment	cu. yds.	15,800	3,888	5,430	24.6	34.4
Lining	cu. yds.	3,320	595	923	17.9	27.8
Puddle	cu. yds.	740	326	462	44.1	62.4
Sawed lumber	ft. B. M.	76,000	0	53,900	0	71
Lumber in miter-sills and gates	ft. B. M.	4,500	0	0	0	0
Lumber in needles	ft. B. M.	7,000	0	0	0	0
Round timber	lin. ft.	5,300	0	2,598	0	49
Second-class concrete	cu. yds.	58,710	19,100	45,280	32.5	77
Reinforced concrete	cu. yds.	387	155	282	40.1	72.9
First-class masonry coping	cu. yds.	3	2.31	2.31	77	77
Dry retaining wall	cu. yds.	6,200	1,677	2,950	27	47.6
Third-class stone paving	sq. yds.	168	78	115	46.4	68.5
Cobblestone paving	sq. yds.	180	0	0	0	0
First-class riprap	cu. yds.	230	0	0	0	0
Fourth-class riprap	cu. yds.	12,400	826	1,819	6.7	14.7
Structural steel	lbs.	155,425	11,855	130,868	7.6	84.2
Metal reinforcement	lbs.	100,940	48,561	78,517	4.8	7.8
Iron castings, plain	lbs.	26,800	10,948	21,627	40.9	80.8
Iron castings, machined	lbs.	13,000	6,324	12,648	48.6	97.3
Metal in upper lock-gates	lbs.	138,000	5,072	8,759	3 7	6.3
Metal in lower lock-gates	lbs.	430,000	6,305	6,851	1.5	1.6
Metal in buffer-beams	lbs.	80,000	2,686	5,327	3.4	6.7
Metal in lock-valves	lbs.	60,000	6,162	6,162	10.3	10.3
Metal in guard-gates	lbs.	680,000	70	276	0.01	0.04
Wooden fence	lin. ft.	1,500	220	550	14.7	36.7
Wrought iron pipe railing	lin. ft.	1,080	0	0	0	0
Lattice railing	lin. ft.	184	67	181	36.4	98.4
Filling seams	lin. ft.	2,500	0	0	0	0
Repointing old masonry	lin. ft.	3,000	0	1,395	0	46.5
Storehouses	No.	2	0	0	0	0
Coffer-dams, pumping, etc	lump sum	$12,000	0	0	0	0
Drilling bolt holes in rock	lump sum	$600	0	0	0	0
Raising bridge superstructures	lump sum	$1,800	0	$1,800	0	100
Maintaining highway traffic	lump sum	$1,000	0	0	0	0
Maintaining navigation	lump sum	$1,000	$250	$250	25	25
Deduct for buildings removed	lump sum	$3,500	0	$3,500	0	100
Deduct for bridge superstructures removed,	lump sum	$50	$25	$50	50	100
Extra Work.						
Bracing timber tow-path		....	$451	$451	100	100

"*Contract No.* 30. This contract extends westward from contract No. 31 and includes 3.1 miles of river line to Jacksonburg, 4.3 miles of land line to Herkimer, 4.5 miles of river line to Frankfort and 3 miles of land line to a point one-half mile east of Sterling creek. The contract includes lock No. 18 at Jacksonburg, a guard-gate and a movable dam at Herkimer, a retaining dam at Frankfort, five bridges and incidental work. The contract was let on July 16, 1909, to the Acme Engineering & Contracting Co. of Schenectady, N. Y. Work was begun during the first week of October, 1909. The contractor's main office is now at Herkimer.

"At lock No. 18, Jacksonburg, the guide walls and most of the south lock wall have been built. A combination dipper and 15-inch suction dredge has been built at Jacksonburg and is now at work on a temporary river channel across the New York Central property west of Little Falls.

"Between Fort Herkimer and Herkimer excavation of the prism and building embankment have been in progress from Sta. 4617 to Sta. 4642, also heavy side hill cuts for prism between Sta. 4646 and Sta. 4658 and between Sta. 4670 and Sta. 4687.

"At Frankfort a 20-inch hydraulic dredge was built during the winter. Dredging was commenced on August 20, 1910, at Sta. 4973, just west of the Frankfort bridge. From Frankfort to the western limit of the contract is about 3 miles and the average cut is about 22 feet. The dredge is averaging about 100 feet per day and was at Sta. 4991 on October 1.

"Progress on this contract previous to June has been slow, due mainly to the necessary delay in building dredges. Satisfactory progress is now being made and the quality of work has at all times been good. The contract is 8.2 per cent completed.

"A large amount of field work has been done on appropriation surveys and running final location lines. Mr. Geo. I. Oakley, Assistant Engineer, has been in charge of this contract with an office at Herkimer and a sub-office at Jacksonburg.

"The following summary shows the amount of work put under contract and the amount done up to September 30, 1910, including the alterations in force:

ITEMS OF WORK.	Preliminary estimate, including alterations to date.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing . . . lump sum	$1,000	$400	$400	40	40
Grubbing . . . cu. yds.	29,700	3,851	3,851	13	13
Excavation . . . cu. yds.	5,095,000	455,840	455,840	8.9	8.9
Sheeting and bracing . . . ft. B. M.	100,000	0	0	0	0
Round timber bracing . . . lin. ft.	1,000	0	0	0	0
Forming embankment . . . cu. yds.	501,000	36,837	36,837	7.3	7.3
Lining . . . cu. yds.	5,800	0	0	0	0
Puddle . . . cu. yds.	300	0	0	0	0
Sawed lumber . . . ft. B. M.	37,000	0	0	0	0
Sawed lumber in lock-needles . . . ft. B. M.	19,000	0	0	0	0
Sawed lumber in miter-sills and gates . . ft. B. M.	9,000	0	0	0	0
Foundation piles . . . lin. ft.	28,600	0	0	0	0
Wooden sheet-piling . . . ft. B. M.	166,000	0	0	0	0
First-quality steel-piling . . . sq. ft.	8,600	0	0	0	0
Second-quality steel-piling . . . sq. ft.	110,000	0	0	0	0
Second-class concrete . . . cu. yds.	34,100	7,575	7,575	22.2	22.2
Third-class concrete . . . cu. yds.	130	0	0	0	0
Second-class reinforced piling . . . cu. yds.	860	8	8	9.3	9.3
First-class masonry coping . . . cu. yds.	7	0	0	0	0
Dry retaining wall . . . cu. yds.	18,400	0	0	0	0
Wash wall . . . cu. yds.	94,200	0	0	0	0
First-class stone paving . . . sq. yds.	3,800	0	0	0	0
Second-class stone paving . . . sq. yds.	340	0	0	0	0
Third-class stone paving . . . sq. yds.	900	0	0	0	0
Cobblestone paving . . . sq. yds.	170	0	0	0	0
First-class riprap . . . cu. yds.	2,300	0	0	0	0
Second-class riprap . . . cu. yds.	2,660	0	0	0	0
Third-class riprap . . . cu. yds.	1,780	0	0	0	0
Fourth-class riprap . . . cu. yds.	31,000	0	0	0	0
Structural steel . . . lbs.	894,750	1,740	1,740	0.2	0.2
Metal reinforcement . . . lbs.	96,000	3,743	3,743	3.9	3.9
Iron castings, plain . . . lbs.	20,000	315	315	1.6	1.6
Iron castings, machined . . . lbs.	9,850	2,058	2,058	20.9	20.9
Metal in lock-gates . . . lbs.	260,000	165	165	0.06	0.06
Metal in buffer-beams . . . lbs.	90,000	87	87	0 1	0.1
Metal in lock-valves . . . lbs.	35,000	0	0	0	0
Metal in guard-gates . . . lbs.	360,000	0	0	0	0
Wood block pavement . . . sq. yds.	300	0	0	0	0
Wooden pavement 2¾ in. thick . . . yds.	280	0	0	0	0
Wooden pavement 3¾ in. thick . . . yds.	900	0	0	0	0
Wooden fence . . . lin. ft.	3,500	0	0	0	0
Lattice railing . . . lin. ft.	980	0	0	0	0
Storehouses . . . No.	2	0	0	0	0
Office buildings . . . No.	3	1	1	33.3	33.3
Crab . . . No.	1	0	0	0	0
Repointing old masonry . . . lin. ft.	18,900	0	0	0	0
Maintaining highway traffic . . . lump sum	$5,000	$250	$250	5	5
Maintaining navigation . . . lump sum	$500	0	0	0	0
Coffer-dams, pumping, etc . . . lump sum	$17,000	$1,530	$1,530	9	9
Raising bridge superstructures . . . lump sum	$1,000	0	0	0	0
Deduct for value of bridge superstructures removed . . . lump sum	$500	0	0	0	0
Deduct for value of buildings removed. lump sum	$700	$140	$140	20	20

ERIE CANAL, RESIDENCY NO. 4-A.

Resident Engineer S. M. Savage reports:

"Residency No. 4-A was established September 9, 1910, with the residency office at 196 Genesee street, Utica. It extends from the west end of contract No. 30, Station 5130, near Sterling creek, to Station 5775, a point just east of the Oriskany road. The section of the canal included in this residency consists of land line being constructed under contracts No. 29, Maryland Dredging Company, contractor, and No. 42, Shanley-Morrissey Company, contractor. The 4 miles being constructed under contract No. 29 lie to the east of the Herkimer-Oneida county line, and are in the Eastern Division. The 8.96 miles being constructed under contract No. 42 lie west of the Herkimer-Oneida county line, and are in the Middle Division.

"*Contract No.* 29. Until Residency 4-A was established, contract No. 29 formed a part of Residency No. 4, the residency office being at Little Falls and the work being under the charge of Mr. Philip H. Dater.

"Mr. Maurice W. Williams is the Assistant Engineer in charge of the engineering on this contract and has an office at Frankfort. The contract was let to the Maryland Dredging Company of Baltimore, Maryland, on April 3, 1909; work was begun in June, 1909; the contract time for completion is December 31, 1911.

"The general condition of the construction on this contract at the date of this report is as follows:

"Excavation from a point about one-third of a mile west of the lock to the westerly end of the contract is practically completed; excavation for the lock chamber is in progress; excavation of channel to the east of the lock is just started.

"Structures: Highway bridge at West Schuyler road,— complete, except for flooring. Highway bridge at Harbor road,— steel work erected and abutments completed; approaches approximately 80 per cent completed. Lock No. 19, near Sterling creek,— masonry not begun. Dive culverts,— masonry not begun.

" The following table shows the amount of all work put under contract, as affected by all alterations to date, and the amount of work done up to September 30, 1910:

ITEMS OF WORK.	Preliminary estimate.	Preliminary estimate, including all alterations.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing....................lump sum	$500	$500	95%	95%	95	95
Grubbing....................cu. yds.	32,000	61,670	22,639	36,645	36.7	59.4
Excavation....................cu. yds.	1,181,000	1,176,200	431,492	533,477	36.7	45.3
Sheeting and bracing..........ft. B. M.	60,000	160,000	47,500	53,100	29.7	33.2
Round timber....................lin. ft.	1,000	1,000	0	0	0	0
Forming embankment..........cu. yds.	309,000	331,400	171,421	182,425	51.7	55
Lining....................cu. yds.	2,370	2,088	510	510	24.4	24.4
Sawed lumber....................ft. B. M.	9,000	26,800	9,400	9,400	35.1	35.1
White oak lumber in miter-sills and gates....................ft. B. M.	8,000	8,000	0	0	0	0
Foundation piles....................lin. ft.	85,140	95,580	6,225	7,505	6.5	7.8
Wooden sheet-piling..........ft. B. M.	43,000	333,000	16,200	16,200	4.8	4.8
Steel sheet-piling....................sq. ft.	1,000	1,000	0	0	0	0
Second-class concrete..........cu. yds.	32,500	33,532	562	967	1.7	2.9
Second-class reinforced concrete..cu. yds.	175	299	84	85	28.1	28.4
First-class masonry coping......cu. yds.	4	4	0	0	0	0
Wash wall....................cu. yds.	32,000	9,180	0	0	0	0
First-class stone paving.........sq. yds.	2,030	2,030	0	0	0	0
Third-class stone paving........sq. yds.	900	460	0	0	0	0
First-class riprap....................cu. yds.	210	210	0	0	0	0
Second-class riprap..............cu. yds.	1,530	720	0	0	0	0
Third-class riprap..............cu. yds.	600	580	0	0	0	0
Fourth-class riprap..............cu. yds.	5,900	6,020	0	0	0	0
9-in. vitrified pipe, laid..........lin. ft.	31	31	0	0	0	0
30-in. vitrified pipe, laid..........lin. ft.	75	41	36	36	87.8	87.8
Structural steel....................lbs.	233,000	338,700	200,348	200,348	59.1	59.1
Metal reinforcement..................lbs.	90,400	114,900	7,756	9,759	6.8	8.5
Iron castings, plain..................lbs.	13,600	13,600	0	0	0	0
Iron castings, machined.............lbs.	8,500	9,500	0	0	0	0
Metal in lock-gates..................lbs.	250,000	250,000	0	0	0	0
Metal in buffer-beams..................lbs.	78,000	78,000	0	0	0	0
Metal in lock-valves..................lbs.	35,000	35,000	0	0	0	0
Wooden pavement..............sq. yds.	560	880	0	0	0	0
Wooden fence....................lin. ft.	2,800	2,340	1,379	1,379	58.9	58.9
Maintaining highway traffic....lump sum	$1,000	$1,000	45%	80%	45	80
Storehouse....................lump sum	$800	$800	0	0	0	0
Office building..............lump sum	$250	$250	25%	100%	25	100
Coffer-dams, pumping, bailing and draining....................lump sum	$7,500	$7,500	0	0	0	0

Total of all work done during the year = 20.1 per cent of estimated cost.
Total of all work done to date = 24.6 per cent of estimated cost.

" *Contract No.* 42. An account of the year's work on this contract will be found in the report of the Middle Division Engineer."

CHAMPLAIN CANAL, RESIDENCY NO. 1.

Resident Engineer Frank N. Sanders reports:

" This residency extends from the connection with contract No. 1, north of the guard-lock at Northumberland, to the junction with the Erie canal at Waterford, a length of about 27 miles.

"A considerable part of the work in this residency has been of a preliminary nature and is described briefly as follows:

" *Contract Plans.* The preliminary estimate and contract drawings for contract No. 73 were finished and sent to Albany in

November, 1909. The plans for contract No. 70 were entirely redrawn and the estimate recomputed, due to changes in the center line and by a decision to remove all proposed spoil banks from the river to areas to be acquired on shore. Work on the plans for contract No. 74 did not proceed very far, pending a decision as to whether the Federal Government would do the work called for on this contract.

"*Appropriation Surveys.* Surveys have been made for 26 parcels of land to be appropriated and maps completed for the same. They are distributed among the contracts as follows: 2 maps revised for contract No. 68; 2 made for contract No. 69; 2 for contract No. 70; 5 for contract No. 71; 4 for contract No. 72 and 11 for contract No. 73. The necessary searches were made in the offices of the county clerks for the above mentioned maps.

"*Stadia Surveys.* A stadia survey was made during the winter of 1909 and 1910 of all land that would be flooded by high water due to building dam No. 1 at the rifts near Pratts, included in contract No. 71. This survey covered considerable territory between lock No. 1 and lock No. 2 at the Hudson River Electric Power Co. and included most of the land between the highway and river on both sides of the stream. The notes of this survey were plotted on the egg-shell maps in the residency office as fast as the survey progressed.

"*Base Line.* During the same period another party reran the old base line for the purpose of resetting missing base line mounments.

"*Ice Soundings.* Soundings were taken through the ice for about a mile of prism on contract No. 72. Ordinates to the center line have been computed for different stretches on the several contracts.

"*Gage Readings.* Beginning March 1, 1910, daily readings have been made on seven gages between locks Nos. 1 and 2 and plotted on a profile. These readings are taken as a matter of record of existing conditions before the construction of dam No. 1.

"The office work has consisted of the regular routine duties, such as checking estimates, etc., augmented by making miscellaneous computations, drawings, tracings, etc.

" Below is given a concise description of the several contracts in this residency:

" Contract No. 68 provides for constructing in the Hudson river, lock No. 3 at Mechanicville, lock No. 4 at Stillwater and lock No. 5 at Northumberland, together with accompanying land lines. Length, about 1.4 miles. Contract price, with alterations, $1,027,135.60.

" Contract No. 69 provides for constructing in the Hudson river, lock No. 2 below Mechanicville. Length, 0.17 mile. Contract price, $240,061.

" Contract No. 70 is for dredging a channel in the Hudson river and performing incidental work between Waterford and lock No. 1. Length, 3.32 miles. Contract price, $779,636.50.

" Contract No. 71 provides for constructing in the Hudson river, lock and dam No. 1 above Waterford and dredging a prism from lock No. 1 to lock No. 2. Length, 3.96 miles. Contract price, $1,561,119.

" Contract No. 72 is for dredging a channel in the Hudson river from lock No. 2 to lock No. 4. Length, 4.1 miles. Contract price, including alteration, $1,202,658.

" Contract No. 73 provides for dredging a channel in the Hudson river and performing work incidental thereto from Stillwater to Northumberland. Length, 15 miles. Contract price, $767,467.

" More detailed descriptions of the several contracts are as follows:

" *Contract No.* 68. This contract was let to Shanley-Morrissey, Inc., November 23, 1908, and work began thereon immediately. During the year ending September 30, 1910, the following work has been done:

"At lock No. 3: At the opening of the season after the high water had receded, a temporary coffer-dam was constructed across the lower end of the lock chamber, connecting the east shore with the west lock wall, which had been constructed during the fall of 1909 to the elevation of high water. Excavation for the east lock wall was then continued and followed up by concreting the east chamber wall within the coffer-dam limits and finishing the west wall sections to elevation of top. During this latter period a well built, sheeted, timber-crib coffer-dam was under way to enclose the entire site of the lower lock and guide wall. The site within this coffer-dam was unwatered July 29 by a 10-inch pump. This coffer-dam is at present being topped by rock excavated from prism to protect it against damage from ice the coming spring. At the date of this report the excavation for all walls below the dam of the West Virginia Pulp & Paper Co. is practically completed and both lock walls below this dam are completed, except the lower west thrust wall. Concreting the lower guide wall is under way. Steel for the lower gate and buffer-beam has been delivered. The steel and concrete apron of the paper mill dam has been removed to make way for further construction. The chief articles of contractor's plant are dinkys, cars, derricks, traveller, Ransome mixer, etc. Mr. A. C. Richards, Assistant Engineer, has been in charge of the work on this lock.

"At Lock No. 4: The steam-shovel finished removing material from the lock site and lower prism during October and November, 1909. Work opened up in the spring of 1910 by building a temporary concrete coffer-dam around the lower end of prism, constructing a trestle across the Hoosick river to give access to a sand pit, erecting traveller, concrete mixer, etc. The east and west abutments of the highway bridge were completed June 10. Steel for the superstructure has been delivered. At the date of this report the entire east lock and guide walls have been finished and the construction of the west lock wall just begun. The chief articles of plant at this lock are derricks, hoisters, traveller, locomotive crane, two Smith mixers, stone crusher and screen, Thew shovel in sand pit, dinkys, cars, etc. Mr. Ralph Hayes, Assistant Engineer, has been in charge of this lock.

"At Lock No. 5: Excavation was finished for the upper guide wall during the fall of 1909 and was continued in the spring of 1910 at the site of the east lock wall and in the upper prism near the highway approach, a Page bucket being used at all these places. Sheeting and bracing were used at the foundation of the upper guide wall and the core wall east of lock. All good material removed from prism was used in building embankment adjacent to prism and around the core wall. Concrete has been placed during the past year in the upper guide wall, the lower end of the south guide wall, in the power house and in the east core and lock walls, until at present there remains but four sections of the east lock wall to complete the concrete work at this lock. During cold weather fresh concrete was covered with canvas and the space between the covering and the concrete was heated by a gridiron of steam pipes. Reinforced concrete was used in building the power culvert, which is completed. Wash wall was laid during the winter and spring along the upper prism between Stations 17+50 and 35+52. All iron and steel have been placed as the work progressed. The contractor's plant at this lock is composed in part of a Haines concrete mixer, hoisters and derricks, dinkys, cars, traveller, etc. Mr. L. T. Howard, Assistant Engineer, has been in charge of this lock.

" The following table shows the amount of work done during the year and the total to date, with percentages:

ITEMS OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing.......lump sum	1	0	100%	0	100
Grubbing.......cu. yds.	4,800	354	3,128	7.3	65.2
Excavation.......cu. yds.	550,000	120,921	483,160	22	87.8
Sheeting and bracing.......ft. B. M.	50,000	37,070	49,540	74.1	99.1
Round timber bracing.......lin. ft.	*1,000	1,977	2,646	197.7	264.6
Channeling.......sq. ft.	170,000	0	0	0	0
Embankment, wet.......cu. yds.	30,000	0	7,413	0	24.7
Embankment, dry.......cu. yds.	43,000	14,805	37,301	34.4	86.7
Lining.......cu. yds.	510	0	0	0	0
Sawed lumber (yellow pine or Douglas fir).ft. B. M.	5,600	0	0	0	0
Sawed lumber in needles.......ft. B. M.	14,000	0	0	0	0
White oak lumber in miter-sills and gates..ft. B. M.	25,000	0	0	0	0
Foundation piles.......lin. ft.	3,000	0	0	0	0
Second-class concrete.......cu. yds.	68,000	34,166	41,891	50.2	61.6
Reinforced concrete.......cu. yds.	1,500	598	598	39.9	39.9
First-class masonry coping.......cu. yds.	5	0	0	0	0
Wash wall.......cu. yds.	2,000	1,094	1,094	54.7	54.7
Third-class stone paving.......sq. yds.	72	0	0	0	0
Fourth-class riprap.......cu. yds.	200	0	0	0	0
Structural steel.......lbs.	180,000	7,294	8,935	4.1	5
Metal reinforcement.......lbs.	61,000	37,593	37,593	61.6	61.6
Iron castings, plain.......lbs.	28,000	5,037	5,037	17.9	17.9
Iron castings, machined.......lbs.	26,000	12,795	14,820	49.2	57
Metal in lock-gates.......lbs.	770,000	5,158	5,158	0.7	0.7
Metal in buffer-beams.......lbs.	240,000	12,182	12,182	5.1	5.1
Metal in lock-valves.......lbs.	100,000	4,785	4,785	4.8	4.8
Wooden pavement, 4 in. thick.......sq. yds.	360	0	0	0	0
Wooden fence.......lin. ft.	1,150	0	0	0	0
Drilling bolt holes in rock.......lin. ft.	1,300	452	452	34.7	34.7
Raising bridge superstructures.......lump sum	1	0	0	0	0
Maintaining highway traffic.......lump sum	1	75%	75%	75	75
Storehouses.......	3	0	0	0	0
Office buildings.......	2	0	2	0	100
Coffer-dams, pumping, bailing and draining. lump sum	1	46.55%	53.97%	46.6	54

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* Increased by 3,000 lin. ft.

"*Contract No.* 69. This contract was let to I. A. Hodge & Co., Inc., December 11, 1909, and work began the following month by building a trestle across the power house tail race to the island where the lock is to be located. A coffer-dam was built around the lower end of the site and a steam-shovel began excavating January 25, 1910. At the present time the excavation is complete below the upper lift wall. Concrete was first placed July 26, 1910, and has continued until the lower guide and buffer-beam walls are now finished, together with three sections of the east lock wall.

"The following table shows the present condition of this contract:

ITEMS OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing ... lump sum	1	100%	100%	100	100
Excavation ... cu. yds.	78,000	51,493	51,493	66	66
Sheeting and bracing ... ft. B. M.	5,000	3,140	3,140	62.8	62.8
Round timber bracing ... lin. ft.	500	423	423	84.6	84.6
Forming embankment ... cu. yds.	100	0	0	0	0
Sawed lumber (yellow pine or Douglas fir) ... ft. B. M.	6,000	0	0	0	0
White oak lumber in miter-sills and lock-gates ... ft. B. M.	9,000	0	0	0	0
Second-class concrete ... cu. yds.	19,400	2,810	2,810	14.5	14.5
Second-class reinforced concrete ... cu. yds.	261	0	0	0	0
First-class masonry coping ... cu. yds.	2	0	0	0	0
Third-class stone paving ... sq. yds.	200	0	0	0	0
Third-class riprap ... cu. yds.	100	0	0	0	0
Fourth-class riprap ... cu. yds.	100	0	0	0	0
Structural steel ... lbs.	181,400	0	0	0	0
Metal reinforcement ... lbs.	26,000	1,374	1,374	5.3	5.3
Iron castings, plain ... lbs.	7,600	0	0	0	0
Iron castings, machined ... lbs.	8,600	0	0	0	0
Metal in lock-gates ... lbs.	260,000	0	0	0	0
Metal in buffer-beams ... lbs.	77,000	0	0	0	0
Metal in lock-valves ... lbs.	34,000	0	0	0	0
Wood pavement, 2¾ in. thick ... sq. yds.	440	0	0	0	0
Wooden fence ... lin. ft.	340	0	0	0	0
Drilling bolt holes in rock ... lin. ft.	310	136	136	43.8	43.8
Coffer-dams, pumping, bailing and draining ... lump sum	1	20%	20%	20	20
Office building ... lump sum	1	1	1	100	100
Storehouse ... lump sum	1	0	0	0	0

"*Contract No.* 70. This contract was let January 11, 1910, to Shanley-Morrissey, Inc., of New York, who began active operations in the month of June. Clearing of the Green island was finished in June, the logs being sawed by a portable saw mill on the ground. Excavation began by a tower scraper July 28 in the land prism south of lock No. 1. Two other towers were built and added to the plant during the summer.

"The table given below shows the progress in detail:

ITEMS OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing .... lump sum	1	65%	65%	65	65
Excavation .... cu. yds.	757,600	136,538	136,538	18.2	18.2
Sheeting and bracing .... ft. B. M.	2,000	0	0	0	0
Forming embankment .... cu. yds.	300	0	0	0	0
Lining .... cu. yds.	210	0	0	0	0
Second-class concrete .... cu. yds.	140	0	0	0	0
Wash wall .... cu. yds.	10,490	0	0	0	0
First-class riprap .... cu. yds.	200	0	0	0	0
Second-class riprap .... cu. yds.	200	0	0	0	0
Third-class riprap .... cu. yds.	200	0	0	0	0
Fourth-class riprap .... cu. yds.	200	0	0	0	0
Iron castings, plain .... lbs.	6,500	0	0	0	0

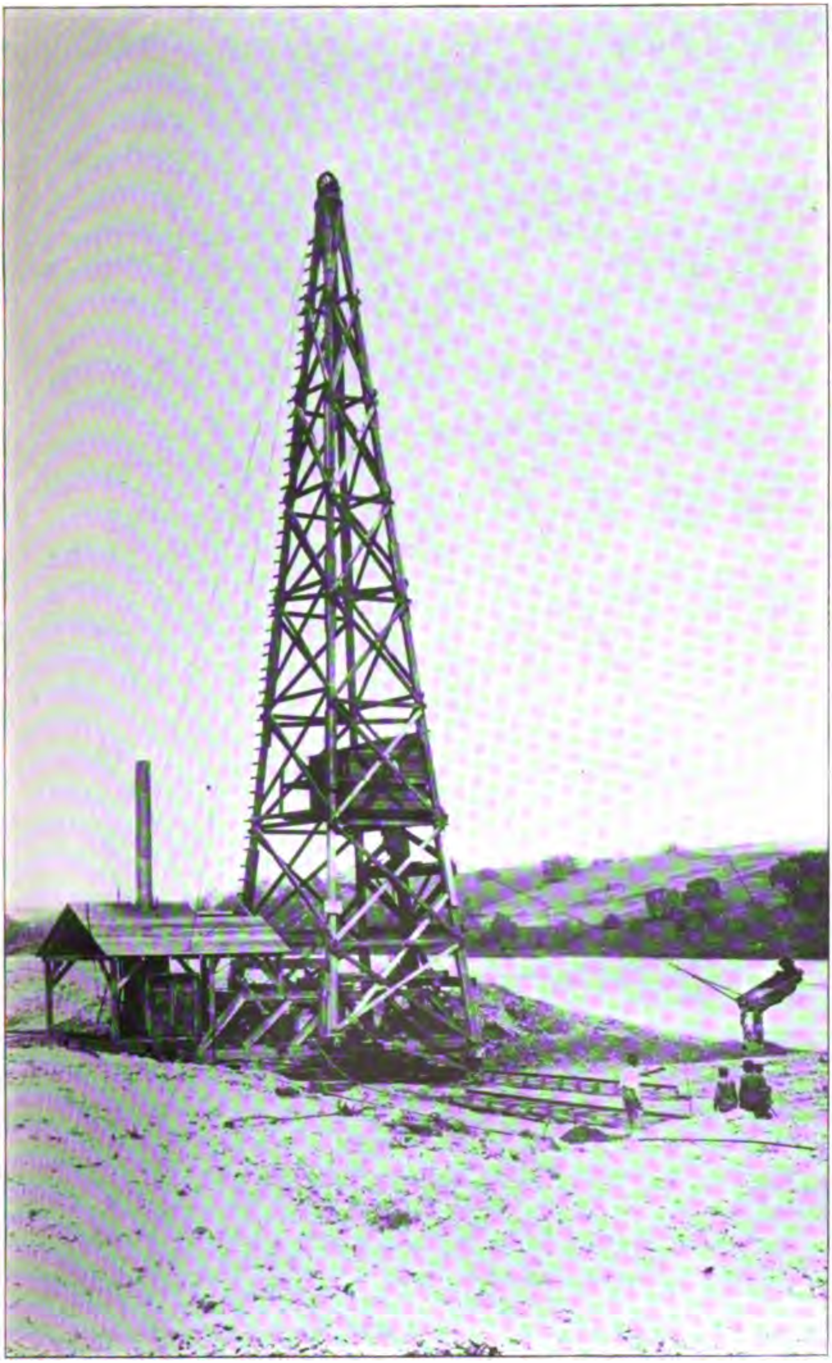
"*Contract No.* 71. This contract was let to Shanley-Morrissey, Inc., January 11, 1910, and work began during the month of April by a tower scraper being placed in operation in the prism just north of site of lock No. 1. After working here for about ten weeks this tower was moved to contract No. 70. During the summer months a coffer-dam was built around the prism at Wright's rifts, enclosing the same between Sta. 1110 and Sta. 1137. After the coffer-dam was pumped out seven drills began drilling July 13 and a model 60 Marion shovel began work July 21. A model 20 shovel, which had been excavating material for coffer-dam filling from spoil bank area, was moved into the prism cut September 15 and began operations. Excavated material was removed about 2,700 feet to spoil bank area by two 6-car trains. All drills and pumps at this site are run by compressed air and the job is lighted by electricity generated by a portable electric light plant. Immediately south of lock No. 2 a similar coffer-dam was built around the prism to Sta. 1045. A steam-shovel has been removing material from this site since September 8, which is removed by two 6-car trains to the spoil area on the Smith farm. A timber trestle gives access to this coffer-dam from the mainland.

"Mr. C. L. McClelland, Assistant Engineer, has been in charge of this contract.

"The table given below shows the condition of this contract at the close of the fiscal year:

ITEMS OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing ... lump sum	1	50%	50%	50	50
Excavation ... cu. yds.	680,000	68,906	68,906	10.1	10.1
Sheeting and bracing ... ft. B. M.	20,000	0	0	0	0
Round timber bracing ... lin. ft.	500	0	0	0	0
Channeling ... sq. ft.	22,000	0	0	0	0
Forming embankment ... cu. yds.	320	0	0	0	0
Lining ... cu. yds.	100	0	0	0	0
Sawed lumber (yellow pine or Douglas fir) ... ft. B. M.	1,500	0	0	0	0
White oak lumber in miter-sills and lock-gates ... ft. B. M.	8,000	0	0	0	0
Second-class concrete ... cu. yds.	27,300	0	0	0	0
Second-class reinforced concrete ... cu. yds.	320	0	0	0	0
Wash wall ... cu. yds.	420	0	0	0	0
Third-class stone paving ... sq. yds.	490	0	0	0	0
First-class riprap ... cu. yds.	300	0	0	0	0
Second-class riprap ... cu. yds.	1,480	0	0	0	0
Third-class riprap ... cu. yds.	300	0	0	0	0
Fourth-class riprap ... cu. yds.	880	0	0	0	0
Structural steel ... lbs.	18,500	0	0	0	0
Metal reinforcement ... lbs.	41,500	0	0	0	0
Iron castings, plain ... lbs.	13,700	0	0	0	0
Iron castings, machined ... lbs.	8,600	0	0	0	0
Metal in lock-gates ... lbs.	236,000	0	0	0	0
Metal in buffer-beams ... lbs.	78,000	0	0	0	0
Metal in lock-valves ... lbs.	33,000	0	0	0	0
Drilling bolt holes in rock ... lin. ft.	1,100	0	0	0	0
Coffer-dams, pumping, bailing and draining ... lump sum	1	0	0	0	0
Office building ... lump sum	1	1	1	100	100
Storehouse ... lump sum	1	0	0	0	0

"*Contract No.* 72. This contract was let to Shanley-Morrissey, Inc., December 14, 1909. Much of the machinery to be used on this contract is of such a character that considerable time is consumed in building the same, which must of necessity be constructed by the pools in which they are intended to work. Therefore work the coming season will be more active than at the present time. At Hart's siding there has been constructed a drill-boat and dipper-dredge and in the pool north of lock No. 3 a hydraulic dredge. These hulls were launched July 18, August 18 and July 20, respectively. The hydraulic dredge began pumping September 25. Cars and coal and dynamite scows were also constructed. At First island (Mechanicville) the prism was enclosed by a coffer-dam, which connected the upper and lower ends of the island with the east shore. Three pumps were used in lowering the water in this dam, after which a shovel was moved in and has just begun work at the date of this report. After the completion of excavation at lock No. 4, contract No. 68, the well



Barge Canal, Contract No. 71.

Tower excavator — a device originated on Barge canal construction. It consists of boiler and engine, tower and drag-scraper bucket. The end of the carrying cable slides on a cable anchorage. Its wide reach has made it an efficient machine.

drills and steam-shovel were moved down to the prism site on this contract, which was laid dry by building a coffer-dam across this branch of the Hudson river at Sta. 820. This coffer-dam was later extended further south adjacent to the Hoosic river, as the season and work advanced. In addition to the articles of plant mentioned, the contractor has constructed at Hart's a well equipped machine shop.

"Mr. H. W. Hale, Assistant Engineer, has been in charge of this contract.

"The following table shows the amount of work already done:

ITEMS OF WORK.		Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing	lump sum	1.	60%	60%	60	60
Excavation	cu. yds.	955,000	102,533	102,533	10.7	10.7
Sheeting and bracing	ft. B. M.	2,000	0	0	0	0
Round timber bracing	lin. ft.	400	0	0	0	0
Stone filling in cribs	cu. yds.	2,400	0	0	0	0
Rock spoil filling	cu. yds.	1,000	0	0	0	0
Structural steel	lbs.	9,000	0	0	0	0
Iron castings, plain	lbs.	5,800	0	0	0	0

"*Contract No.* 73. This contract was let May 26, 1910, to E. M. Graves of Cleveland, Ohio. The only contract work done thus far has been in the vicinity of the old guard-lock at Northumberland, where a small amount of material has been removed from the prism by teams and scrapers and placed in embankment near the G. & J. railroad bridge. Excavation has also been under way for the east retaining wall near Sta. 3+00, a clam-shell being used in this work. A dipper-dredge is being assembled at the Hemlocks, where it was removed to the river from the Champlain canal, and the hydraulic dredge *Fort Edward* is being erected on the river bank near the outlet of Fish creek at Schuylerville. Dikes have also been thrown up to retain the hydraulic fill for two spoil banks near Schuylerville, a tower scraper being used at one location and a New Era grader with traction engine at the other.

"Mr. L. T. Howard, Assistant Engineer, has been in charge of this contract.

"The following table shows the present conditions of this contract:

ITEMS OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing.......lump sum	1	8%	8%	8	8
Excavation.......cu. yds.	1,306,000	10,375	10,375	0.8	0.8
Sheeting and bracing.......ft. B. M.	17,000	0	0	0	0
Round timber bracing.......lin. ft.	5,000	0	0	0	0
Forming embankment.......cu. yds.	21,500	3,789	3,789	17.6	17.6
Lining.......cu. yds.	1,200	0	0	0	0
Sawed lumber (yellow pine or Douglas fir)...ft. B. M.	2,000	0	0	0	0
Wooden sheet-piling.......ft. B. M.	2,000	0	0	0	0
Second-class concrete.......cu. yds.	6,500	0	0	0	0
Second-class reinforced concrete.......cu. yds.	29	0	0	0	0
Wash wall.......cu. yds.	5,800	0	0	0	0
Second-class stone paving.......sq. yds.	160	0	0	0	0
First-class riprap.......cu. yds.	200	0	0	0	0
Second-class riprap.......cu. yds.	200	0	0	0	0
Third-class riprap.......cu. yds.	300	0	0	0	0
Fourth-class riprap.......cu. yds.	1,500	0	0	0	0
Structural steel.......lbs.	19,000	0	0	0	0
Metal reinforcement.......lbs.	6,200	0	0	0	0
Iron castings, plain.......lbs.	10,800	0	0	0	0
Wooden pavement.......sq. yds.	165	0	0	0	0
Wooden fence.......lin. ft.	2,400	0	0	0	0
Drilling bolt holes in rock.......lin. ft.	670	0	0	0	0
Moving bridge at lock No. 5.......lump sum	1	0	0	0	0
Moving bridge superstructures.......lump sum	1	0	0	0	0
Maintaining highway traffic.......lump sum	1	0	0	0	0
Maintaining navigation.......lump sum	1	0	0	0	0
Coffer-dams, pumping, bailing and draining.lump sum	1	0	0	0	0

CHAMPLAIN CANAL, RESIDENCY NO. 2.

Resident Engineer E. V. R. Payne reports:

"*Contract No.* 1.

"For excavating the river channel from Northumberland to Fort Miller and from Crocker's Reef to Fort Edward; the construction of the Crocker's Reef dam and the approaches to the head and foot of the 'land line' and other incidental work. Length, 7.075 miles. Contractor, Empire Engineering Corporation. Engineer in charge for the State, Edward W. Wendell, Assistant Engineer. Date of contract, April 18, 1905.

"All work on this contract was confined to the southern section, extending from Northumberland to Fort Miller, where the dipper-dredge *Peconic* has operated one daily 8-hour shift at various points from October 1, 1909, to November 30, 1909, when it was placed in winter quarters back of the cribs at Fort Miller, where repairs were made to dredge and other plant during the winter.

" Dredging operations were resumed on April 4, 1910, and continued, one shift per day only, during the balance of the year, as the Lobnitz rock-breaker by working three shifts daily could loosen only material enough for the dredge to handle during one shift. The material excavated was practically all Hudson river shale rock, and amounted to 11,172 cubic yards, and the work was done in the vicinity of Fort Miller and the Northumberland change bridge. The material excavated north of Sta. 44 was placed in a spoil area along the east side of the river opposite Hill street, Fort Miller, while that taken south of Sta. 44 was placed in the river spoil area below the Northumberland bridge.

" The Lobnitz rock-breaker has worked continuously, except for numerous break-downs and repairs, three shifts per day during the fiscal year, except from December 9, 1909, to March 22, 1910.

" *Embankment.* No work has been done during this year on the embankment, and the quantities remain the same as in the previous report.

" *Timber Cribs.* 19,700 ft. B. M. were placed in the timber crib at Fort Miller approach to lock No. 6; also nine mooring piles, with which the cribs were completed, and the structure has held its line and to date has not settled.

" Of the other items on the contract, no work has been done, and the percentage is shown in the tabulation.

" The following is a summary of the items on contract No. 1 as they stand on September 30, 1910, as modified by all alterations:

ITEMS OF WORK.	Preliminary estimate.	Quantities as modified by alterations 1, 2, 3. 5 and 6.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing........................lump sum	1	1	0	45%	0	45
Grubbing........................cu. yds.	2,400	2,400	0	2,366	0	98.6
All excavation....................cu. yds.	913,500	868,450	11,172	698,489	1.3	80.4
Forming embankment............cu. yds.	26,000	26,000	0	24,657	0	94.8
Yellow pine timber and plank....ft. B. M.	90,000	85,000	19,107	85,724	22.4	100.9
Round timber in cribs..............lin. ft.	70,750	68,950	0	65,343	0	94.8
Mooring piles........................each	10	10	9	9	90	90
Iron and steel fastenings..............lbs.	3,500	3,500	0	308	0	8.8
First-class concrete...............cu. yds.	1,000	1,000	0	828	0	82.8
Second-class concrete.............cu. yds.	4,110	4,065	0	3,448.6	0	84.8
Third-class concrete..............cu. yds.	300	300	0	331.3	0	110.4
Wash wall, including coping.......cu. yds.	7,750	7,750	0	5,906	0	76.2
Stone filling......................cu. yds.	6,250	7,757	0	7,442	0	95.9
First-class riprap.................cu. yds.	326	326	0	241	0	73.9

" *Contract No.* 3.

" For the excavation of the canal and the protection of its banks from Sta. 147+75, below lock No. 6 at Fort Miller, to Sta. 262+00, above the guard-gate at Crocker's Reef; the construction of lock No. 6 and its approaches, the guard-gate and its approaches, the bridge abutments and foundations at Sta. 151+60, Sta. 173+18, Sta. 213+40 and Sta. 247+50; the removal and reërection of the present bridge at East street; the change in location of the old Champlain canal and all other incidental work. Contractors, Sundstrom & Stratton. Engineer in charge for the State, C. A. Curtis, Assistant Engineer. Date of contract, April 4, 1905.

" *Excavation.* This contract covers about 2.16 miles of canal in land line, connecting the Northumberland-Fort Miller pool with the Crocker's-Fort Edward pool, and is located on the east side of the Hudson river between Fort Miller and Crocker's Reef. Excavation for the canal prism was begun April, 1905, and excepting a small amount of excavation made by teams and graders, the work was done by steam-shovels and side dump cars. With the finishing of the wash wall notch and leveling of various spoil banks, all excavation and embankment were completed late in November, 1909. Wash wall and riprap were completed during October and November, 1909.

"A considerable amount of resurfacing the concrete by bush hammering was done during October and November on the walls of the lock and approaches. South of Sta. 252+00 all work was completed before the last of November, 1909.

" The balance of the excavation between Stations 252+00 and 262+00, which is the north end of the contract, by an alteration, is to be taken from contract No. 3 and included in another contract, which leaves the coffer-dam between contracts 1 and 3 to be removed by this new contract, as this coffer-dam cannot be dispensed with until the guard-gate is completed.

"The following is a summary of the items on contract No. 3 as they stand on September 30, 1910, as modified by all alterations to date:

ITEMS OF WORK.	Preliminary estimate.	Quantities as modified by alterations 1 to 7.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing.....................lump sum	1	1	0	1	0	100
Grubbing.....................cu. yds.	6,500	8,389	1,307	7,082	15.6	84.4
All excavation.................cu. yds.	849,000	837,231	0	799,273	0	95.5
Forming embankment..........cu. yds.	113,000	115,503	6,927	116,564	5.9	100.8
Lining.......................cu. yds.	3,300	5,300	161	4,986	3	94.75
Puddle.......................cu. yds.	900	900	0	734	0	81.5
Yellow pine timber and plank..ft. B. M.	84,000	50,000	0	44,351	0	88.7
White oak timber in miter-sills..ft. B. M.	2,000	3,000	0	1,185	0	39.5
Hemlock timber and plank.....ft. B. M.	11,000	11,000	0	9,179	0	83.4
Foundation piles, 15 ft. long.........No.	8	8	0	8	0	100
Foundation piles, 20 ft. long.........No.	4	4	0	4	0	100
Foundation piles, 25 ft. long.........No.	4	4	0	4	0	100
Second-class concrete...........cu. yds.	28,000	36,711	0	33,895.9	0	92.3
Third-class concrete............cu. yds.	650	450	0	365.8	0	81.3
First-class masonry.............cu. yds.	10	10	0	0	0	0
Wash wall, including coping.....cu. yds.	28,500	27,458	2,759	23,363	10	85
First-class riprap...............cu. yds.	1,600	1,600	722	953	45.1	59.5
Iron castings......................lbs.	129,000	136,867	0	129,025	0	94.2
Steel castings.....................lbs.	23,000	5,000	0	1,477	0	29.5
Structural steel....................lbs.	24,000	65,403	0	28,859	0	44.1
Wooden fencing.................lin. ft.	7,300	4,800	69	3,378	1.4	70.4
Removing and resetting old bridge superstructure.................lump sum	1	1	0	1	0	100
Sidewalk.......................lin. ft.	0	450	0	419	0	93
Iron castings, machined.............lbs.	0	24,000	0	25,152	0	104
All excavation outside original lines, cu. yds.	....	18,000	1,719	22,746	9.5	126
All additional forms, etc., for concrete, lump sum	0	1	0	$5,820	0	100
All additional forms for recesses for operating machinery and capstans..lump sum	0	1	0	$393 07	0	100

"*Contract No.* 3-A.

"For the removal of certain dwellings, barns, stables, shops, outhouses and other structures, their foundations and other accessories, the cleaning out of all vaults and cesspools and disposal of their contents, building foundations, for moving house to parcel No. 148, for excavating cellar and for moving schoolhouse on parcel No. 141, on the site of contract No. 3. Contractors, Sundstrom & Stratton. Engineer in charge for the State, C. A. Curtis, Assistant Engineer. Date of contract, October 3, 1905.

"Work on this contract was completed by the removal of a portion of the icehouse, which stood on the right of way appropriated from Sarah Thorpe. The balance of the work on this contract was done during 1905.

"*Contract No.* 26.

"For dredging a channel in the Hudson river between the south end of contract No. 27, Sta. 1245, at Fort Edward, and the north end of contract No. 1, Sta. 1286+33. Length, 0.76 mile. Contractor, Lake Erie Dredging Co. Engineer in charge for the State, Edward W. Wendell, Assistant Engineer. Date of contract, April 6, 1908.

"The dipper-dredge excavated in the prism from October 1, to December 11, 1909, when, together with the remainder of the plant, it was laid up in winter quarters. On April 2, 1910, repairs were started on dredge, tug, scows and clam, and they were put in readiness and dredging began on April 25, 1910, continuing until June 10, 1910, when the contract was completed.

"The dredged material was hauled in bottom dump scows and spoiled in front of the crib bulkhead; from there it was placed in the spoil area by the clam and leveled to the top of crib with drag scrapers.

"To test the dredged channel for final acceptance, a 30-foot length of steel rail, swung at the stern of a scow, was used as a sweep.

"During the winter of 1909–1910 a considerable amount of material silted between Sta. 1255+00 and the north end of the contract. This section of the contract is between the north wall of lock No. 7 and the south end of Bradley's island and is not intended for navigation. It was made to allow a clear passage for the river, due to the changed conditions in the river by the construction of this lock. This silted material was dredged during May, 1910.

"The final estimate for this contract has been finished and the work accepted.

"The following is a summary of the items on contract No. 26 as they stand on September 30, 1910, as modified by all alterations to date:

ITEMS OF WORK.	Preliminary estimate.	Quantities as modified by alteration No. 1.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing.................lump sum	$25	$25	$15	$25	60	100
All excavation.............cu. yds.	172,000	115,200	40,122.9	101,922.9	34.8	88.5

"*Contract No.* 54.

"For constructing lock No. 7 at Fort Edward. Length 0.22 mile. Contractors, Scott Brothers, of Rome, N. Y. Engineer in charge for the State, C. A. Curtis, Assistant Engineer. Date of contract, December 13, 1909.

"This contract includes the building of lock No. 7 and approach walls at the point where the Barge canal leaves the Hudson river south of Fort Edward and enters the land line to Wood creek. This lock was formerly included in contract No. 27 and was located at a point one thousand feet north of its present site, the change in location being due to an unsatisfactory foundation.

"Contractors' plant arrived during March and April, 1910, and on April 23 the first test piles were driven. Driving test piles was continued until May 3, and from this test it was determined that piles were necessary for the foundation and the bill of round and sheet-piles was given to the contractors for lengths of 16 feet and 20 feet.

"Difficulty was found in locating a safe site for the concrete plant, on account of the representatives of the Public Works Department maintaining that the canal banks of the present Champlain canal, opposite the lock, were weak and unsafe for carrying the load of a concrete plant and storage bins. The Public Works Department finally selected a site opposite the north end of this contract, along the bank of the old Champlain canal.

"The mixing plant consists of a Smith mixer with overhead bins for sand and stone and a cement house on the level of the tow-path, all of which are served by a stiff-leg derrick and clam, handling the materials directly from canal boats.

"After clearing the trees from the north end of the contract, excavation was begun at the north end of the upper approach wall and the wall was started in alternate blocks, concrete being delivered to the wall by two Lockwood buckets on a flat car and placed in the forms by a stiff-leg derrick. As the grade of the excavation was below the river level, an 8-inch centrifugal pump, operated by electric power, was required to unwater the trench, and as the work progressed south, a ten-inch pump was added.

"When the wall reached the bank of the river, Lackawanna steel sheet-piling was driven around the section, enclosing 160 feet of wall. When this wall was completed, the steel piling was pulled and another section of the same length was enclosed. The excavation has been done by a three-quarter cubic yard Owen clam bucket, operated by the stiff-leg derrick which started June 26. On July 6 foundation piles for the north end of the wall were driven. Concrete was first placed on July 16.

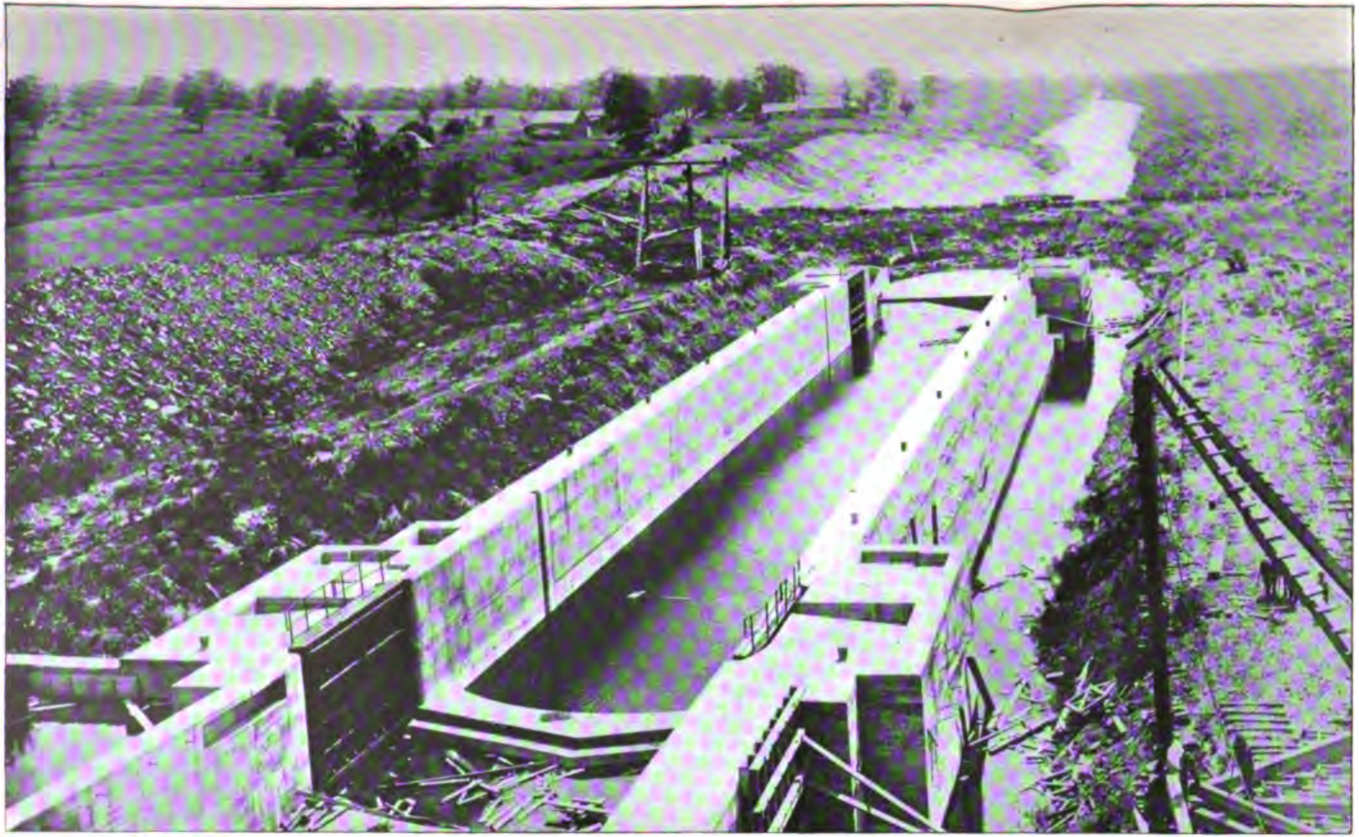
"As the excavated material was largely decayed wood, logs, saw-dust and leaves, which was unsuitable for embankment material, a borrow-pit was used from a near-by spoil bank on contract No. 27, consisting of gravel and clay, to supply embankment material for filling the trench along the front and back of this wall.

"The amount of work done on contract No. 54 for the fiscal year ending September 30, 1910, is as follows:

ITEMS OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Excavation.............................cu. yds.	45,600	909	909	1.9	1.9
Sheeting and bracing...................ft. B. M.	2,000	200	200	10	10
Forming embankment.....................cu. yds.	11,300	619	619	5.4	5.4
Foundation piles.........................lin. ft.	60,600	4,647	4,647	7.6	7.6
Wooden sheet-piling....................ft. B. M.	225,000	46,500	46,500	20.6	20.6
Second-class concrete..................cu. yds.	21,700	1,309	1,309	6	6
Coffer-dams, pumping, bailing and draining......	1	30%	30%	30	30

"*Contract No.* 27.

"For excavating the canal and protecting its sides, constructing locks No. 7, No. 8 and junction lock, necessary spillways, power plants and appertaining structures, a concrete arch bridge, bridge substructures and approaches, retaining wall, highways and other incidental details, between Sta. 1046+16, the south end of contract No. 25, at Dunhams Basin road, and the Hudson river at Fort Edward, Sta. 1245. Length of contract, 3.76 miles. Contractor, Kinser Construction Co. Engineer in charge for the State, S. W. Belding, Assistant Engineer. Date of contract, November 23, 1906.



BARGE CANAL, CONTRACT NO. 27.

Bird's-eye view of lock No. 8. Champlain canal, near Fort Edward.

"Work was suspended on this contract in December, 1908, resulting from a slide at the original site of lock No. 7, and the plans had to be revised to the extent that lock No. 7 was eliminated from contract No. 27 and located about 1,000 feet south and placed under a new contract — No. 54. The contractor refused to proceed with the balance of the work, contending that it was an abrogation of the contract. The matter was adjusted in the Court of Claims, from which an award was received by the contractor, including the payment of the 10 per cent retained for work done to date and an allowance for materials delivered, including round and sheet-piles and other minor items of work. The balance of the work left unfinished on contract No. 27 has been embodied in a new contract — No. 27-A.

"In the fall of 1909, by order of the State Engineer, the Department of Public Works completed the bridge approaches, including the lining for the road surface and guard-rail at Dunhams Basin bridge. This was done to allow the contractor on the adjoining contract, No. 25, to cut through the temporary highway a short distance north of this bridge, and also to maintain traffic for the public.

"On account of the slide at the site of lock No. 7, it was necessary, to maintain navigation at this point, to build a dike along the west side of the excavation for lock No. 7, forming a pool to carry the present Champlain canal level from the Argyle street bridge to the Hudson Valley railway bridge. This work was done by the Department of Public Works in the spring of 1909.

"During the fiscal year the Kinser Construction Company has removed the principal part of their plant from the contract.

"During the year the engineering corps has completed three estimates in connection with this contract, namely: One for all work remaining to be done by the Kinser Construction Co., divided into two parts — one north and the other south of Sta. 1224; another estimate for the reletting of the contract, called No. 27-A; and the final estimate of work done by the Kinser Construction Co.

"*Contract No.* 32.

"For constructing the lock-gates, needle-beams, needles and lock-valves on contracts Nos. 3, 25 and 27. Contractor, Penn

Bridge Company. Engineers in charge for the State, C. A. Curtis, Assistant Engineer, at lock No. 6, and S. W. Belding, Assistant Engineer, at lock No. 8. Date of contract, April 19, 1909.

" LOCK No. 6. The work was done at lock No. 6 by a small force of men, working through the winter of 1909–1910. A great deal of trouble was caused by the heavy snow storms of this season, nearly one-third of the time spent in construction being lost, either on account of the storms, or the removal of snow and ice.

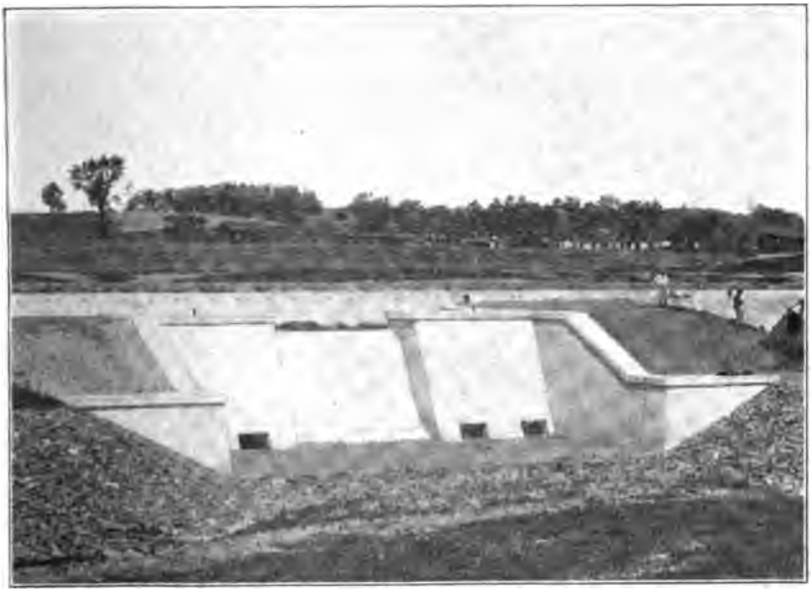
" The needle-beams and needles were placed first and served as a coffer-dam in which to erect lock-gates and valves. A large portion of the rivets were driven by compressed air. After the timber on the gates and needle-beams had received their treatment of carbolineum, provided in the contract, a coat of black paint was applied by laborers from the engineering force. The needles are stored in a building near the lock site, purchased from Sundstrom & Stratton.

" The following is a summary of quantities:

1,235	ft. B. M. sawed lumber, yellow pine or Douglas fir, $50..................	$61 75
6,074	ft. B. M. white oak sawed lumber in lock-gates, $95	577 03
15,098	ft. B. M. sawed lumber in needles, $67..	1,011 56
0.48	cu. yds. reinforced concrete, $12.50.....	6 00
211,369	lbs. metal in lock-gates, $0.0419........	8,856 36
57,244	lbs. metal in needle-beams, $0.054......	3,091 17
33,993	lbs. metal in lock-valves, $0.089........	3,025 38
	Total	$16,629 25

" LOCK No. 8. The contractor began work at lock No. 8 about February 24, 1910, and practically finished the contract about June 15, 1910, although there have been several small items of change and repair since, so that the work was not in shape for final acceptance until about September 30, 1910.

"A small building (25 by 40 feet) at lock No. 8 has been purchased by the State and in it are stored the needles, concrete covers for the gate anchorages, wrenches, etc.



Barge Canal, Contract No. 25.
View of the siphon spillway at Smiths Basin, showing the outlets.

" The timber on the gates and needle-beam has been given a third coat of carbolineum, and the quoin and miter posts a coat of black paint, — as an additional preventative against checking. This work was done by laborers of the engineering corps.

" The following is a summary of quantities:

1,312	ft. B. M. sawed lumber, yellow pine or Douglas fir, $50	$65	60
4,354	ft. B. M. white oak sawed lumber in lock-gates, $95	413	63
12,564	ft. B. M. sawed lumber in needles, $67	841	79
0.48	cu. yds. reinforced concrete, $12.50	6	00
160,459	lbs. metal in lock-gates, $0.0419	6,723	23
52,632	lbs. metal in needle-beams, $0.054	2,842	13
22,587	lbs. metal in lock-valves, $0.089	2,010	24
	Total	$12,902	62

" *Contract No.* 16.

" For furnishing and erecting in place steel highway bridge superstructures as follows: On contract No. 27, Champlain canal, section 2, Dunhams Basin bridge, Sta. 1048+70; East St. bridge, Sta. 1178+00; Argyle St. bridge, Sta. 1218+85; bridge below lock No. 7. Contractor, The United Construction Co. Engineer in charge for the State, S. W. Belding, Assistant Engineer. Date of contract, December 20, 1906.

" No work has been done on this contract during the year. The Dunhams Basin bridge was completed during the winter of 1908–1909."

CHAMPLAIN CANAL, RESIDENCY NO. 3.

Resident Engineer D. B. LaDu reports:

" *Contract No.* 25. For excavating the canal and protecting its sides, constructing lock No. 9 and necessary spillways, power plants and appertaining structures, bridge substructures and approaches, retaining walls, highways and other incidental details between Sta. 356, about 0.6 mile north of Comstock post-office, Washington county, and Sta. 1041+54, which is also Sta. 1046+16 at Dunhams Basin road, Washington county. The length of this contract is 13 miles. This contract was awarded to the Atlantic, Gulf & Pacific Company on November 19, 1906.

" The dredge *Champlain* worked during parts of November and December, excavating from Dewey's bridge to within about 1,000 feet of Flat Rock. The dredge began excavating again the latter part of March and excavated from the above point to about one and a quarter miles north of Fort Ann. The dredge was then taken to contract No. 15 for a short time and afterwards bottomed out at various places between the north end of the contract and lock No. 9 at Smiths Basin. About the middle of August the dredge passed through lock No. 9 and since that time has excavated about two and a half miles south of lock No. 9.

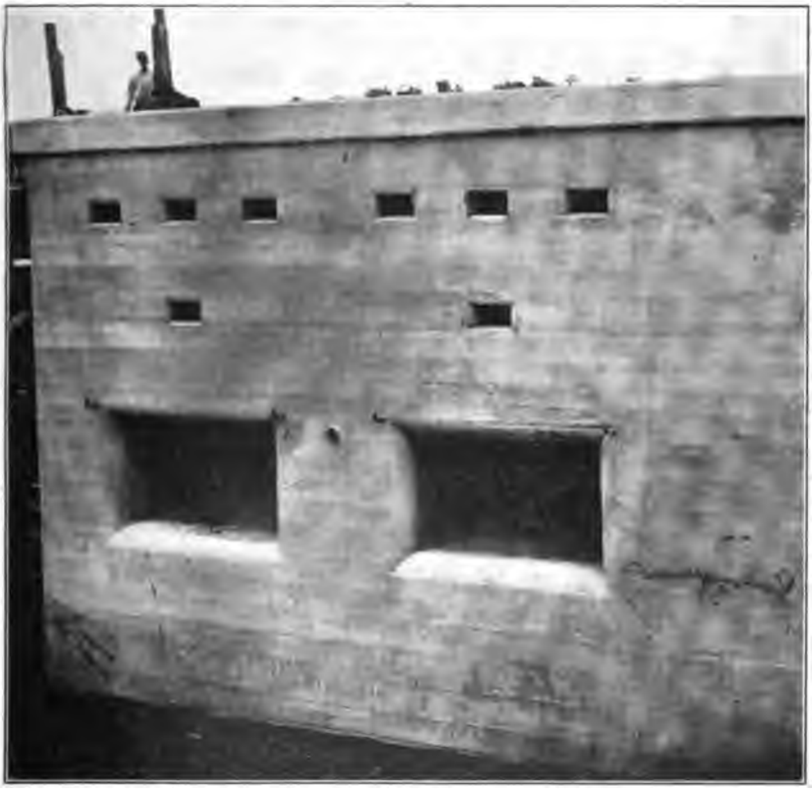
" The dipper-dredge worked until December and from March to the present time, excavating rock, old walls and gravel, which the hydraulic dredge could not handle, between the north end of the contract and Fort Ann.

" The towers and traveling derrick, which worked until December, finished up the levees built along the banks of the canal. The traveler started up in March and completed the back levees at the south end of the contract and also the excavation at the northwest approach of lock No. 9.

" Excavation was also made for part of the Halfway creek entrance and by hand for Smiths Basin bridge, Dewey's bridge and about half of Brayton's bridge, also for part of Fort Ann bridge. Work has proceeded continuously at the rock cuts between Comstock and Flat Rock by hand.

" Embankment was placed for Dewey's bridge approaches and nearly completed. Embankment was completed back of lock No. 9 and nearly completed back of the approach walls. Embankment and lining were placed for the highway between the north end of the contract and Flat Rock and completed with the exception of about 1,000 feet near old lock No. 19.

" Piles were driven for Dewey's bridge, Smiths Basin bridge and about half of Brayton's bridge, and under the upper approach walls at lock No. 9. About one-third of the pile docking at lock No. 9 was completed. The sheet-pile revetment south of lock No. 9 was completed.



BARGE CANAL. CONTRACT NO. 25.

View of the siphon spillway at Smiths Basin, showing intakes and vents of two siphons, before gratings had been hung over the intakes.

" The concrete, etc., in lock No. 9 was completed, excepting the northwest approach wall. Smiths Basin bridge was completed and Dewey's bridge about one-half finished.

" Wash wall was laid from the north end of the contract to Dewey's bridge, with the exception of a few places to fill in.

" The face of old lock No. 18 was dressed to conform to specifications and the temporary bridge at Fort Ann moved.

" The following is a summary for the year ended September 30, 1910:

ITEMS OF WORK.	Preliminary estimate, including alterations Nos. 1, 2, 3 4, 5 and 7.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing ... acres	65.69	0	65.69	0	100
Grubbing ... cu. yds.	36,600	0	9,435	0	26
All excavation ... cu. yds.	5,599,000	837,139	4,242,069	15	76
Embankment ... cu. yds.	156,150	33,728	43,351	22	28
Lining ... cu. yds.	14,050	6,796	8,295	48	59
Sheeting and bracing ... ft. B. M.	35,200	2,151	2,151	6	6
Sawed lumber, hemlock ... ft. B. M.	2,800	0	2,570	92	92
Sawed lumber, yellow pine or Douglas fir ... ft. B. M.	151,800	31,939	31,939	21	21
White oak in miter-sills ... ft. B. M.	1,700	1,586	1,586	100	100
Piling ... No.	2,626	831	1,794	30	66
Sheet-piling ... ft. B. M.	1,249,000	681,180	1,022,066	54	82
Concrete (all classes) ... cu. yds.	27,167	10,886	24,607	40	90
Wash wall ... cu. yds.	52,905	5,431	5,431	10	10
Riprap (all classes) ... cu. yds.	6,245	148	1,603	2	26
Paving, second-class ... sq. yds.	3,387	0	15	0	1
Ballast ... cu. yds.	338	0	85	0	25
Cast iron, plain ... lbs.	27,800	7,786	22,931	28	82
Cast iron, machined ... lbs.	20,000	10,828	19,068	54	95
Metal reinforcement ... lbs.	63,195	20,325	33,974	32	54
Structural steel ... lbs.	58,780	18,697	24,435	32	42
Fender fastenings ... No.	283	263	263	93	93
Dressing face of wall ... lump sum	$350	$350	$350	100	100
Moving temporary bridge ... lump sum	$800	$800	$800	100	100
Gross estimate ...	$1,691,819	$487,653	$1,204,161	29	71

" *Contract No.* 15. For excavating the canal and protecting its sides, constructing lock No. 11, dam No. 4, lock No. 12, dam No. 5, and appertaining structures, a spillway, a highway, two masonry culverts, five bridges with their piers and abutments and other incidental details, between Lake Champlain at Whitehall, Washington county, Sta. 0–73, and Sta. 356 on Wood creek, about 0.6 mile north of Comstock post-office, Washington county. This contract was awarded to the Atlantic, Gulf & Pacific Company on August 9, 1906. Its length is 6.8 miles, extending from Lake Champlain at Whitehall to a point about 0.6 mile north of Comstock.

"At Whitehall the work on lock No. 12 was rushed during the season closed for navigation on the Champlain canal and by working three eight-hour shifts. About one-half of the west lock wall was completed, the lower gates and needle-beam erected and the lower part of the lock opened for navigation on May 15, 1910. No construction work can be done on the remainder of the lock during the open season for navigation.

" During the summer of 1910 about 6,000 cu. yds. of rock were removed from the creek bed east of the lock to provide a channel for flood waters. The structures in Wood creek, including dam No. 5, siphon spillway and pier for the Clinton Avenue bridge, were completed, with the exception of one section of the dam.

" The southeast approach wall of lock No. 12 has been completed and part of the drilling and excavation made for the southwest approach wall.

" Prism slopes on both sides of the canal from Whitehall south for about three miles have been trimmed by a floating excavator. This machine has been dismantled and shipped to contract No. 25.

" At lock No. 11 the northwest and southeast approach walls and the lock, on which work was well advanced last year, have been completed.

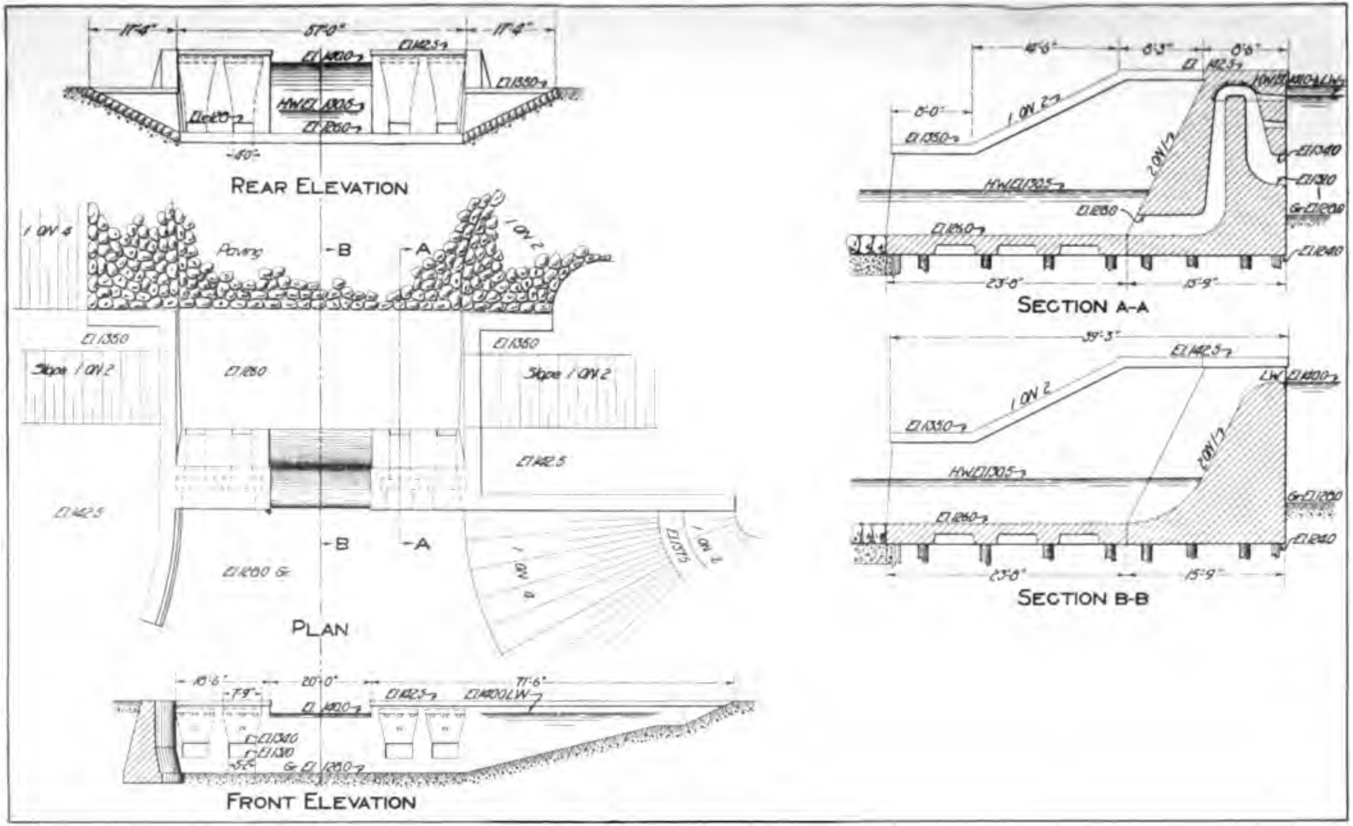
" New structures built at this place are dam No. 4 and the power plant for the lock.

" During November, 1909, the dredge *Champlain* removed about 10,000 cu. yds. from the prism at lock No. 11 and deposited about 7,000 cu. yds. of this as embankment behind the west lock wall and the northwest and southwest approach walls. On the completion of this work the dredge was moved to contract No. 25.

" During April, May and June, 1910, the dredge *Champlain* removed about 152,000 cu. yds. from the prism and by-pass at lock No. 11 and placed about 27,000 cu. yds. of this as embankment behind the lock and approach walls. On June 11 the dredge returned to contract No. 25.

" The dipper-dredge *Comstock* removed about 7,000 cu. yds. of the wash wall of the present Champlain canal near lock No. 11 and also built a coffer-dam for the construction of dam No. 4.

" The substructure of the Clinton Avenue bridge at Whitehall has been completed and the west plate girder span assembled and rivetted. The remaining two spans of this bridge will be erected and rivetted within a short time.



BARGE CANAL, CONTRACT NO. 25.
Plan, elevations and sections of the siphon spillway at Smiths Basin.

"A gravel highway, about 1,200 ft. long, was constructed on the east side of the canal at lock No. 11 and a large amount of grading was done for a similar highway on the west side of the canal at the same location.

"All work at lock No. 12 has been handled by one stiff-leg and five guy derricks.

"Wood creek has been diverted since July into a narrow channel next to the completed east wall of lock No. 12, in order to build dam No. 5, siphon spillway, and pier for the Clinton Avenue bridge. As this deprived the Champlain Silk Mills of their water-power, the contractors have furnished the mill with electric power from Carver's Falls.

"The Delaware and Hudson R. R. Company practically finished the construction of a double-track, rivetted bridge over the new canal for their Rutland Branch.

"Construction work has progressed satisfactorily throughout the year.

"The following is a summary for the year ended September 30, 1910:

ITEMS OF WORK.	Preliminary estimate, including alterations.	Work done during year.	Total work done to date.	Per cent of work during year.	Per cent of work done to date.
Clearing....acres	12.36	0	12.36	0	100
Grubbing....cu. yds.	12,000	0	7,957	0	66
All excavation....cu. yds.	2,924,700	201,795	2,474,072	6.9	84.5
Sheeting and bracing....ft. B. M.	50,000	5,185	22,560	10.4	45.1
Forming embankment....cu. yds.	173,200	61,273	63,401	35.3	36.6
Lining....cu. yds.	4,432	620	620	14	14
Sawed lumber, hemlock....ft. B. M.	40,000	0	20,061	0	50
Sawed lumber, yellow pine or Douglas fir..ft. B. M.	100,500	0	19,208	0	20
White oak in miter-sills....ft. B. M.	4,430	961	2,919	21.7	65.8
Stone filling in cribs....cu. yds.	850	0	567	0	67
Piling....No.	8,766	183	*6,287	2	71.7
Sheet-piling....ft. B. M.	100,740	0	87,412	0	87
All classes concrete....cu. yds.	57,190	11,270	47,904	19.7	83.7
Third-class stone paving....sq. yds.	2,187	11	11	.5	.5
Second-class riprap....cu. yds.	1,150	225	225	19.5	19.5
4-inch vitrified pipe....lin. ft.	300	0	268	0	89
Iron castings....lbs.	163,883	9,247	132,700	5.6	80.9
Iron castings, machined....lbs.	50,000	5,943	48,604	11.8	97.2
Structural steel....lbs.	1,155,683	72,587	98,782	6.2	8.5
Metal reinforcement....lbs.	121,050	20,345	36,018	16.8	29.7
Ballast....cu. yds.	160	2	2	1.2	1.2
Upper lock-gates....lump sum	$11,100	0	$5,550	0	50
Lower lock-gates, lock 11....lump sum	$8,500	0	$8,500	0	100
Lower lock-gates, lock 12....lump sum	$9,900	$9,900	$9,900	100	100
Needle-dam, lock 11....lump sum	$5,200	$2,132	$5,200	41	100
Needle-dam, upper end, lock 12....lump sum	$2,400	$816	$1,056	34	44
Needle-dam, lower end, lock 12....lump sum	$3,100	$2,790	$3,100	90	100
Needle-dam, across head race....lump sum	$700	$700	$700	100	100
Lock-valves....lump sum	$7,200	$1,800	$7,200	25	100
Gross estimate....	$1,477,216	$162,120	*$1,096,540	10.9	74.2

* Includes amount of extra work orders

"*Contract No.* 90. For furnishing and installing equipment for operating and lighting locks Nos. 9, 11 and 12 on Champlain canal.

"This contract was let on April 12, 1910, for $178,197, to the D'Olier Engineering Company of Philadelphia, Pa. The contract plans and approved plans for most of the work have been received. The contractor has organized a plant at lock No. 11 on the Champlain canal and is beginning construction. Material for construction is being forwarded to the various points. A small estimate was rendered for September, 1910.

"*Contract No.* 16. For the construction of certain bridges on contract No. 25.

"No construction work has been done on this residency by the contractors of contract No. 16, as it is the desire of the Atlantic, Gulf & Pacific Company not to have the bridges placed until after they have done the final trimming of the canal prism.

"*Contract No.* 32. For constructing lock-gates, needle-beams, needles and lock-valves at lock No. 9, on contract No. 25.

"Work was begun in December, 1909, and completed in May, 1910. The work consisted of placing the needle-beams, erecting and rivetting the gates and installing the valves. White oak quoin posts, toe posts and fenders were constructed on the ground, as also were the needles of yellow pine.

"*Contract No.* 33. For constructing the operating machinery for the movable dam at Whitehall, contract No. 15.

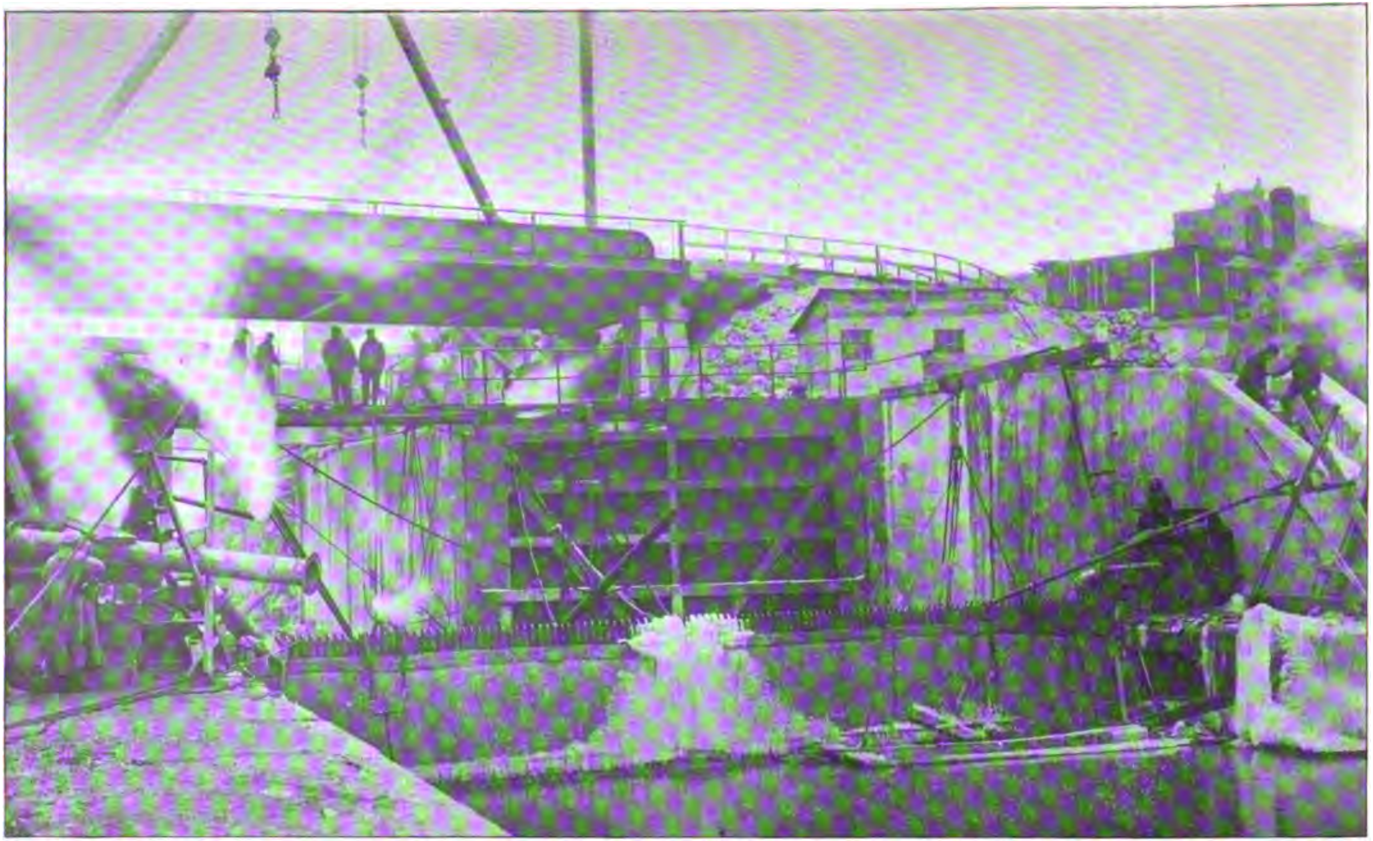
"No construction work has been done on this contract, as the Clinton Avenue bridge has not been entirely erected."

APPENDED TABLES.

Tables giving the engineering expenses of the division for the fiscal year and also other tables showing the contracts in force during the year, both those completed and those still pending, will be found appended to my report.

Respectfully submitted.

GEORGE D. WILLIAMS,
Division Engineer.



Barge Canal, Contract No. 15.

View from below lower gates of Whitehall lock, showing needle-dam in place.

THE FOLLOWING STATEMENTS SHOW THE NAMES, RANK AND COMPENSATION OF ENGINEERS EMPLOYED IN THE EASTERN DIVISION OF THE DEPARTMENT OF THE STATE ENGINEER AND SURVEYOR, TOGETHER WITH INCIDENTAL EXPENSES, FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1910.

Ordinary Repairs to Canals — Erie Canal.

Chapter 432, Laws of 1909.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Geo. D. Williams	Division engineer	$4,200 per year	$3,350 00		$3,350 00
J. A. O'Connor	First resident engineer	3,000 per year	17 86	$6 27	24 13
R. D. Parsons	Financial clerk	150 per month	150 00		150 00
Hattie A. Dell	Stenographer	100 per month	549 99		549 99
G. L. Schillner	Engineering draftsman	5 00 per day	250 00		250 00
J. B. Maguire	Assistant engineer	6 00 per day	12 00	4 16	16 16
E. A. Dollard	Leveler	4 50 per day	13 50		13 50
Frank Roberts	Rodman	4 00 per day	288 00		288 00
A. J. Crowe, Jr	Axeman and office assistant	2 00 per day	4 00		4 00
			$4,635 35	$10 43	$4,645 78
	Incidental Expenses.				
Stationery and printing				$163 00	
Fuel and light				238 60	
Postage				395 00	
Telephone and telegraph				1,361 94	
Miscellaneous				1,187 96	
					3,346 50
Total					$7,992 28

Ordinary Repairs to Canals — Champlain Canal.

Chapter 432, Laws of 1909.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
George D. Williams	Division Engineer	$4,200 per year	$350 00		$350 00
R. D. Parsons	Financial clerk	5 00 per day	250 00		250 00
P. D. Wendell	Estimate clerk	200 per month	200 00		200 00
Loretta C. Cantwell	Stenographer	50 00 per month	25 81		25 81
Hattie A. Dell	Stenographer	100 per month	283 33		283 33
C. D. Burrus	Engineering draftsman	6 00 per day	18 00		18 00
J. B. Maguire	Assistant engineer	6 00 per day	48 00	$12 03	60 03
Frank Roberts	Rodman	4 00 per day	572 00	5 60	577 60
H. V. Button	Chainman	2 50 per day	5 00		5 00
Henry MacFarlane	Laborer	2 00 per day	54 00		54 00
			$1,806 14	$17 63	$1,823 77
	Incidental Expenses.				
Stationery and printing				$191 95	
Fuel and light				347 10	
Postage				381 73	
Telephone and telegraph				753 97	
Miscellaneous				509 20	
					2,183 95
Total					$4,007 72

Construction of Barge Canal — Head Office Account.

Chapter 147, Laws of 1903, and amendatory laws.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Wm. B. Landreth	Special deputy state engineer	$6,000 per year	$5,749 98	$296 90	$6,046 88
H. D. Alexander	Resident engineer	3,000 per year	3,000 00	245 38	3,245 38
R. S. Greenman	Resident engineer	2,700 per year	2,625 00	2,220 54	4,845 54
R. E. Horton	Resident engineer	3,000 per year	2,601 13	2,150 00	4,751 13
C. H. MacCulloch	Resident engineer	2,700 per year	2,625 00	15 13	2,640 13
S. M. Savage	Resident engineer	3,000 per year	2,716 67	107 34	2,824 01
Noble E. Whitford	Resident engineer	3,000 per year	2,925 00	71 19	2,996 19
W. G. Wildes	Resident engineer	2,400 per year	954 84	7 04	961 88
Wm. R. Davis	Chief bridge designer	3,900 per year	3,730 11	166 75	3,896 86
G. M. Braune	Assistant chief bridge designer	3,000 per year	2,650 00	18 51	2,668 51
J. G. Peck	Assistant chief bridge designer	3,000 per year	185 48	88 39	273 87
John Bartholomew	Bridge designer	175 per month	1,731 49		1,731 49
R. C. Bastress	Bridge designer	175 per month	256 67		256 67
E. A. Brainerd	Bridge designer	175 per month	2,070 83	3 36	2,074 19
H. E. Brainard	Bridge designer	150 per month	331 07	64 00	395 07
E. J. Carney	Bridge designer	150 per month	926 77		926 77
J. C. Green	Bridge designer	175 per month	2,041 67		2,041 67
C. N. Haggart	Bridge designer	175 per month	2,054 09		2,054 09
A. G. Hayden	Bridge designer	175 per month	1,014 22		1,014 22
A. H. Higley	Bridge designer	175 per month	1,597 58		1,597 58
F. A. Hermans	Bridge designer	125 per month	681 45		681 45
Harold Levy	Bridge designer	175 per month	1,947 58		1,947 58
H. D. Miller	Bridge designer	175 per month	2,016 62	11 40	2,028 02
J. C. Podmore	Bridge designer	140 per month	1,670 00		1,670 00
J. M. C. Quarles de Quarles	Bridge designer	140 per month	1,205 26		1,205 26
E. P. Quirk	Bridge designer	115 per month	55 65		55 65
H. J. Scheuermann	Bridge designer	175 per month	2,100 00		2,100 00
E. G. Semon	Bridge designer	125 per month	1,402 15		1,402 15
C. H. Wood	Bridge designer	175 per month	1,518 39		1,518 39
I. S. Abrahams	Bridge draftsman	125 per month	229 83		229 83
J. M. Angus	Bridge draftsman	125 per month	1,229 70		1,229 70
Wm. P. Falkemstein	Bridge draftsman	125 per month	888 23		888 23
Leo Freitag	Bridge draftsman	100 per month	425 92		425 92
G. E. Maynard	Bridge draftsman	125 per month	1,131 19		1,131 19
A. C. Miller	Bridge draftsman	100 per month	530 15		530 15
R. M. Wheeler	Bridge draftsman	125 per month	676 61		676 61
E. E. Briggs	Junior bridge draftsman	100 per month	1,200 00		1,200 00
J. F. Blaise	Junior bridge draftsman	90 per month	931 93		931 93
J. A. Pritchard	Junior bridge draftsman	85 per month	890 48	13 80	904 28
C. E. Quimby	Junior bridge draftsman	90 per month	712 09		712 09
C. C. Egbert	Expert on electrical design	20 00 per day	2,070 00		2,070 00
G. F. Stickney	Expert lock designer	375 per month	4,500 00	218 47	4,718 47
E. F. Van Hoesen	Expert on R. R. crossings	375 per month	4,500 00	170 39	4,670 39
D. A. Watt	Expert on movable dams	375 per month	4,366 94	505 80	4,872 74
J. T. Durham	Confidential assistant	4,000 per year	3,892 43	169 25	4,061 68
A. G. Chapman	Chief clerk	3,000 per year		29 82	29 82
J. H. McElroy	Chief clerk	200 per month	2,265 23	262 08	2,527 31
H. E. Breed	Financial clerk and auditor	250 per month	2,949 99	488 46	3,438 45
R. D. Parsons	Financial clerk	150 per month	20 00	16 07	36 07
J. M. Smelzer	Index clerk	135 per month	1,540 00		1,540 00
Parkes D. Wendell	Estimate clerk	200 per month	300 00	23 51	323 51
C. B. Dunham, Jr.	Clerk	100 per month	1,200 00	27 93	1,227 93
J. T. Gorman	Clerk	100 per month	1,200 00	26 75	1,226 75
J. C. Guffin	Clerk	100 per month	1,200 00		1,200 00
J. E. F. Minnock	Clerk	83 33 per month	908 33		908 33
Geo. W. Ruso	Clerk	100 per month	1,200 00		1,200 00
Geo. T. Waterman	Clerk	80 per month	960 00		960 00
Grace Brennan	Stenographer	75 per month	183 87		183 87
Nelle Clark	Stenographer	100 per month	1,200 00	6 75	1,206 75
Adelle Hallenbeck	Stenographer	83 33 per month	933 99		933 99
Grace Haswell	Stenographer	75 per month	900 00		900 00
Bertha E. Kirchner	Stenographer	60 per month	491 55		491 55
S. C. MacNeil	Stenographer	100 per month	1,050 00		1,050 00
Kathryn Riley	Stenographer	60 per month	60 00		60 00
J. J. Tobin	Stenographer	75 per month	795 00		795 00
Cleora Van Vleck	Stenographer	100 per month	1,200 00		1,200 00
Mabel Wienholz	Stenographer	100 per month	1,200 00		1,200 00
C. D. Burrus	Engineering draftsman	6 00 per day	1,500 00		1,500 00
E. G. Blessing	Engineering draftsman	5 00 per day	790 00		790 00
E. A. Bonney	Engineering draftsman	5 00 per day	1,825 00	38 70	1,863 70
E. S. Cullings	Engineering draftsman	4 00 per day	156 00		156 00

Construction of Barge Canal — Head Office Account — (Cont'd).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
G. G. Dixon..........	Engineering draftsman..........	$4 50 per day	$603 00	....	$603 00
L. L. Hadley..........	Engineering draftsman..........	4 50 per day	1,387 00	....	1,387 00
E. C. Hackett..........	Engineering draftsman..........	4 00 per day	268 00	....	268 00
H. W. Lockwood......	Engineering draftsman..........	5 00 per day	1,230 00	....	1,230 00
John H. McCormick, Jr.	Engineering draftsman..........	5 00 per day	1,448 00	....	1,448 00
G. D. Meer..........	Engineering draftsman..........	5 00 per day	1,372 00	....	1,372 00
J. A. O'Donnell..........	Engineering draftsman..........	5 00 per day	1,570 00	....	1,570 00
Wm. J. Picard..........	Engineering draftsman..........	5 00 per day	1,535 00	....	1,535 00
Geo. L. Schillner......	Engineering draftsman..........	5 00 per day	120 00	....	120 00
J. L. Southworth......	Engineering draftsman..........	5 00 per day	1,191 00	....	1,191 00
John H. Stevens......	Engineering draftsman..........	5 00 per day	1,378 00	....	1,378 00
Rupert Sturtevant....	Engineering draftsman..........	5 00 per day	1,570 00	....	1,570 00
A. W. Thayer..........	Engineering draftsman..........	4 50 per day	702 00	....	702 00
S. T. Vosburgh........	Engineering draftsman..........	4 00 per day	1,143 48	....	1,143 48
L. B. Westfall..........	Engineering draftsman..........	5 00 per day	1,550 00	....	1,550 00
J. J. Cosgrave..........	Architectural draftsman..........	125 per month	1,332 58	$2 23	1,324 81
R. R. Shearer..........	Architectural draftsman..........	125 per month	1,181 19	....	1,181 19
F. E. Blake..........	Mechanical engineer..........	175 per month	2,066 13	9 10	2,075 23
J. A. Jensen..........	Mechanical draftsman..........	100 per month	913 91	....	913 91
W. S. Klos..........	Mechanical draftsman..........	100 per month	1,170 00	....	1,170 00
C. P. Wiweke..........	Meçhanical draftsman..........	100 per month	1,062 26	....	1,062 26
Theron Ainsworth.....	Tracer..........	75 per month	858 15	....	858 15
R. B. Allen..........	Tracer..........	60 per month	319 68	....	319 68
J. G. Allen..........	Tracer..........	50 per month	64 29	....	64 29
Leroy Bamer..........	Tracer..........	60 per month	606 97	....	606 97
John H. Forth..........	Tracer..........	75 per month	840 00	....	840 00
Bernard Gazier..........	Tracer..........	75 per month	812 90	....	812 90
W. J. Henk..........	Tracer..........	50 per month	235 48	....	235 48
Chas. T. Kniskern, Jr..	Tracer..........	75 per month	900 00	....	900 00
G. L. Knott..........	Tracer..........	75 per month	107 50	....	107 50
Maximiliam Komow...	Tracer..........	75 per month	107 50	....	107 50
Charles Messina..........	Tracer..........	75 per month	499 42	....	499 42
Philip R. Murray.	Tracer..........	75 per month	825 00	....	825 00
J. J. Ryan..........	Tracer..........	50 per month	250 81	....	250 81
F. C. Ashley..........	Assistant engineer..........	6 00 per day	1,374 00	8 63	1,382 63
Clark Brown..........	Assistant engineer..........	6 00 per day	1,878 00	3 00	1,881 00
C. R. Chase..........	Assistant engineer..........	6 00 per day	912 00	21 27	933 27
J. S. Clancy..........	Assistant engineer..........	6 00 per day	1,560 00	....	1,560 00
W. S. Coulter..........	Assistant engineer..........	6 00 per day	1,284 00	24 57	1,308 57
F. S. Crowell..........	Assistant engineer..........	6 00 per day	1,357 00	....	1,357 00
D. H. Daley..........	Assistant engineer..........	6 00 per day	1,884 00	13 32	1,897 32
E. J. Doyle..........	Assistant engineer..........	6 00 per day	924 00	....	924 00
F. M. Eames..........	Assistant engineer..........	6 00 per day	1,878 00	10 23	1,888 23
R. G. Finch..........	Assistant engineer..........	6 00 per day	1,811 50	....	1,811 50
H. A. Gehring..........	Assistant engineer..........	6 00 per day	758 50	....	758 50
G. E. Gibson..........	Assistant engineer..........	6 00 per day	1,512 00	....	1,512 00
H. W. Hale..........	Assistant engineer..........	6 00 per day	912 00	....	912 00
R. L. Holt..........	Assistant engineer..........	6 00 per day	1,878 00	....	1,878 00
Chas. Kiehm..........	Assistant engineer..........	6 00 per day	1,782 00	....	1,782 00
F. C. Koerner..........	Assistant engineer..........	5 50 per day	828 50	....	828 50
H. C. Kline..........	Assistant engineer..........	5 00 per day	1,020 00	....	1,020 00
D. R. Lee..........	Assistant engineer..........	6 00 per day	192 00	....	192 00
O. F. Lewis..........	Assistant engineer..........	6 00 per day	1,608 00	2 35	1,610 35
J. B. Maguire..........	Assistant engineer..........	6 00 per day	186 00	....	186 00
I. S. Matlaw..........	Assistant engineer..........	6 00 per day	948 00	....	948 00
A. S. Mirick..........	Assistant engineer..........	6 00 per day	738 00	....	738 00
C. W. Morris, Jr.......	Assistant engineer..........	6 00 per day	1,878 00	....	1,878 00
C. D. Murray..........	Assistant engineer..........	6 00 per day	1,436 00	7 76	1,443 76
E. P. Neuschwander...	Assistant engineer..........	6 00 per day	1,360 00	2 66	1,362 66
J. P. Newton..........	Assistant engineer..........	6 00 per day	1,854 00	....	1,854 00
P. W. O'Grady..........	Assistant engineer..........	6 00 per day	78 00	....	78 00
A. T. O'Leary..........	Assistant engineer..........	5 00 per day	275 00	....	275 00
E. C. Olcott..........	Assistant engineer..........	6 00 per day	1,452 00	....	1,452 00
R. E. Phillips..........	Assistant engineer..........	6 00 per day	1,914 00	12 68	1,926 68
F. D. Porter..........	Assistant engineer..........	5 00 per day	85 00	....	85 00
E. G. Raynor..........	Assistant engineer..........	6 00 per day	1,854 00	....	1,854 00
G. W. Stickney..........	Assistant engineer..........	6 00 per day	1,544 00	....	1,544 00
A. D. Sanderson..........	Assistant engineer..........	6 00 per day	1,350 00	....	1,350 00
W. H. Slingerland.....	Assistant engineer..........	6 00 per day	1,878 00	....	1,878 00
A. E. Steere..........	Assistant engineer..........	6 00 per day	126 00	35 64	161 64
J. H. Sturdevant......	Assistant engineer..........	6 00 per day	660 00	4 80	664 80
G. G. Underhill..........	Assistant engineer..........	6 00 per day	1,139 00	100 10	1,239 10
C. R. Vanneman..........	Assistant engineer..........	5 00 per day	605 00	....	605 00
H. A. Weeks..........	Assistant engineer..........	6 00 per day	1,620 00	....	1,620 00

Construction of Barge Canal — Head Office Account — (Cont'd).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
J. H. Young	Assistant engineer	$6 00 per day	$948 00		$948 00
H. T. Arnold	Leveler	5 00 per day	1,555 00		1,555 00
R. N. Barrett	Leveler	4 50 per day	405 00	$2 99	407 99
A. T. Clark	Leveler	5 00 per day	1,565 00		1,565 00
N. E. Cottrell	Leveler	4 50 per day	1,174 00		1,174 00
T. W. Dix	Leveler	4 50 per day	400 50		400 50
E. A. Dollard	Leveler	4 50 per day	463 50	4 96	468 46
A. C. Eaton	Leveler	5 00 per day	280 00		280 00
M. D. Ewell	Leveler	4 50 per day	126 00	6 78	132 78
J. A. Glominski	Leveler	4 50 per day	1,120 00	1 68	1,121 68
T. A. Hendrickson	Leveler	5 00 per day	225 00		225 00
A. P. Mussi	Leveler	4 50 per day	1,008 00		1,008 00
R. W. Smith	Leveler	4 50 per day	130 00	22 18	152 18
H. S. Sparr	Leveler	5 00 per day	1,196 50		1,196 50
G. G. Sweet	Leveler	5 00 per day	1,565 00		1,565 00
. R. Tizhe	Leveler	5 00 per day	690 00		690 00
T. L. Watkins	Leveler	5 00 per day	1,570 00	11 08	1,581 08
J. B. Whipple	Leveler	4 50 per day	108 00	6 18	114 18
D. A. Young	Leveler	4 50 per day	247 50		247 50
Jacob Bendel	Rodman	3 50 per day	423 50		423 50
H. F. Hills	Rodman	3 50 per day	244 00		244 00
C. H. Hurley	Rodman	3 50 per day	66 50		66 50
G. B. Kelley	Rodman	3 50 per day	1,057 00		1,057 00
A. T. Madison	Rodman	3 50 per day	70 00	6 18	76 18
A. R. Patchke	Rodman	4 00 per day	1,256 00		1,256 00
J. M. Prior	Rodman	3 50 per day	31 50		31 50
H. J. Richardson	Rodman	4 00 per day	28 00	35 99	63 99
J. C. Sophian	Rodman	3 50 per day	91 00		91 00
J. L. Ames	Chainman	2 50 per day	50 00		50 00
M. H. Boigeol	Chainman	3 00 per day	939 00		939 00
H. V. Button	Chainman	3 00 per day	700 00		700 00
J. G. Bushnell	Chainman	2 50 per day	271 50		271 50
Samuel Covner	Chainman	2 50 per day	5 00		5 00
W. H. Dodd	Chainman	3 00 per day	939 00		939 00
Harold F. Eagan	Chainman	3 00 per day	12 00		12 00
Wm. Gimberg	Chainman	2 50 per day	57 50		57 50
Karl Moulton	Chainman	3 00 per day	79 00		79 00
J. T. Murphy	Chainman	3 00 per day	960 00		960 00
J. J. MacDonald	Chainman	2 50 per day	5 00		5 00
E. C. Niles	Chainman	3 00 per day	369 00		369 00
N. B. Robbins	Chainman	3 00 per day	820 00		820 00
J. F. Scharf	Chainman	2 50 per day	22 50		22 50
M. Stanley Bierce	Inspector of masonry	5 00 per day	1,565 00		1,565 00
J. M. Taylor	Inspector of masonry	4 50 per day	378 00		378 00
D. F. Allen	Laborer	2 00 per day	600 00		600 00
Wm. Atkinson	Laborer	2 00 per day	716 00		716 00
A. M. Barton	Laborer	2 00 per day	514 00		514 00
J. H. Boyland	Laborer	2 00 per day	628 00		628 00
G. E. Cumner	Laborer	2 00 per day	608 00		608 00
George Cunningham	Laborer	2 00 per day	636 00		636 00
R. J. Dobbins	Laborer	2 00 per day	158 00	10 80	168 80
Alexander Greenwald	Laborer	2 00 per day	520 00		520 00
James Haley	Laborer	2 00 per day	630 00		630 00
J. Harrington	Laborer	2 00 per day	48 00		48 00
Harry Hertz	Laborer	2 00 per day	172 00		172 00
E. W. Hiser	Laborer	2 00 per day	10 00		10 00
G. W. Linden	Laborer	2 00 per day	368 00		368 00
Simeon Lodewick	Laborer	2 00 per day	548 00		548 00
J. M. Macdonald	Laborer	2 00 per day	626 00		626 00
Henry MacFarlane	Laborer	2 00 per day	420 00		420 00
M. A. McMahon	Laborer	2 00 per day	52 00		52 00
L. E. Moore	Laborer	2 00 per day	658 00		658 00
Leonard Paige	Laborer	2 00 per day	106 00		106 00
C. A. Parry	Laborer	2 00 per day	16 00		16 00
H. S. Parsons	Laborer	2 00 per day	120 00		120 00
Thomas Rattoone	Laborer	2 00 per day	660 00		660 00
W. J. Smith	Laborer	2 00 per day	282 00	3 38	285 38
Julius Stern	Laborer	2 00 per day	642 00		642 00
Michael Tierney	Laborer	2 00 per day	626 00		626 00
H. J. Whitman	Laborer	2 00 per day	38 00		38 00
M. E. Baker	Axeman and office assistant	2 00 per day	640 00		640 00
A. J. Banker	Axeman and office assistant	2 00 per day	28 00		28 00
K. M. Boutelle	Axeman and office assistant	2 00 per day	634 00		634 00
T. E. Bowen	Axeman and office assistant	2 00 per day	726 00		726 00

Construction of Barge Canal — Head Office Account —(Concl'd).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
F. P. Burmaster	Axeman and office assistant	$2 00 per day	$10 00	....	$10 00
J. S. Burns	Axeman and office assistant	2 00 per day	666 00	....	666 00
A. J. Crowe, Jr	Axeman and office assistant	2 00 per day	14 00	....	14 00
G. B. Fitzgerald	Axeman and office assistant	2 00 per day	706 00	....	706 00
Edgar Hull	Axeman and office assistant	2 00 per day	536 00	....	536 00
Robert J. Maloy	Axeman and office assistant	2 00 per day	258 00	....	258 00
D. B. Mattice	Axeman and office assistant	2 00 per day	460 00	....	460 00
Julius Mishkin	Axeman and office assistant	2 00 per day	338 00	....	338 00
J. J. Murnane	Axeman and office assistant	2 00 per day	636 00	....	636 00
J. T. Smith	Axeman and office assistant	2 00 per day	26 00	....	26 00
P. D. Unger	Axeman and office assistant	2 00 per day	628 00	....	628 00
Sibella Carroll	Charwoman	1 25 per day	391 25	....	391 25
E. M. Chamberlain	Night watchman	80 per month	960 00	....	960 00
Cornelius Contant	Night watchman	80 per month	26 67	....	26 67
F. M. Hill	Title maker	120 per month	1,300 00	....	1,300 00
F. C. Batt	Automobile driver	100 per month	546 88	$185 14	732 02
E. H. Wetsel	Foreman public works	5 00 per day	1,570 00	....	1,570 00
			$234,853 71	$8,019 39	$242,873 10
Incidental Expenses.					
Instruments, tools and appliances				$294 39	
Office rent				4,791 67	
Fuel and light				283 70	
Stationery and printing				11,031 81	
Postage				1,373 26	
Telephone and telegraph				2,087 81	
Miscellaneous				18,619 99	
					38,482 63
Total					$281,355 73

Construction of Barge Canal — Erie Canal.

Chapter 147, Laws of 1903, and amendatory laws.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Geo. D. Williams	Division engineer	$4,200 per year	$233 34	$476 85	$710 19
J. A. O'Connor	First resident engineer	3,000 per year	1,571 37	504 95	2,076 32
P. H. Dater	Resident engineer	2,700 per year	2,700 00	665 52	3,365 52
E. D. Hendricks	Resident engineer	2,400 per year	2,052 00	261 69	2,313 69
E. A. Lamb	Resident engineer	2,700 per year	2,625 00	309 59	2,934 59
E. J. Pickwick	Resident engineer	3,000 per year	2,925 00	292 08	3,217 08
C. Arthur Poole	Resident engineer	2,400 per year	32 25	....	32 25
S. M. Savage	Resident engineer	3,000 per year	91 66	38 93	130 59
H. O. Schermerhorn	Resident engineer	2,400 per year	2,160 00	99 61	2,259 61
A. E. Steere	Resident engineer	2,400 per year	1,932 00	71 61	2,003 61
E. P. Williams	Resident engineer	3,000 per year	2,725 00	297 16	3,022 16
H. E. Brainard	Bridge designer	175 per month	1,119 81	153 21	1,273 02
Parkes D. Wendell	Estimate clerk	200 per month	1,300 00	....	1,300 00
R. D. Parsons	Financial clerk	150 per month	985 00	....	985 00
L. H. Hurd	Clerk	112 50 per month	459 00	....	450 00
Hattie A. Dell	Stenographer	100 per month	100 00	....	100 00
P. J. Gaffey	Stenographer	50 per month	306 45	....	306 45
Bertha E. Kirchner	Stenographer	60 per month	220 71	....	220 71
J. A. Murray	Stenographer	75 per month	795 00	....	795 00
G. R. Rankin	Stenographer	50 per month	337 91	....	337 91
William Shaw	Stenographer	50 per month	27 42	....	27 42
J. A. Galvin	Engineering draftsman	5 00 per day	1,237 00	....	1,237 00
E. C. Hackett	Engineering draftsman	5 00 per day	1,197 00	....	1,197 00
F. W. Harris	Engineering draftsman	5 00 per day	1,396 00	38 64	1,434 64
E. L. Keeler	Engineering draftsman	5 00 per day	1,645 00	....	1,645 00
R. H. Warrin	Engineering draftsman	4 00 per day	228 00	....	228 00
J. J. Cosgrave	Architectural draftsman	125 per month	161 29	....	161 29
C. S. Allen	Tracer	75 per month	750 00	....	750 00
A. G. Austin	Assistant engineer	6 00 per day	1,950 00	488 13	2,438 13

Construction of Barge Canal — Erie Canal —(Continued).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Lewis Bartlett	Assistant engineer	$6 00 per day	$2,052 00	$140 44	$2,192 44
E. J. Becker	Assistant engineer	6 00 per day	2,028 00	20 96	2,048 96
J. C. Bell	Assistant engineer	6 00 per day	1,974 00	373 92	2,347 92
D. E. Bellows	Assistant engineer	6 00 per day	1,128 00	88 44	1,216 44
H. W. Benedict	Assistant engineer	6 00 per day	828 00	....	828 00
C. R. Chase	Assistant engineer	6 00 per day	774 00	27 25	801 25
E. M. Ellis	Assistant engineer	6 00 per day	426 00	55 92	481 92
F. W. Harris	Assistant engineer	6 00 per day	1,224 00	86 74	1,310 74
Oscar Hasbrouck	Assistant engineer	6 00 per day	1,630 00	12 15	1,642 15
Edwin Hilborn	Assistant engineer	6 00 per day	1,260 00	114 03	1,374 03
L. S. Hulburd	Assistant engineer	6 00 per day	54 00	42 20	96 20
M. E. James	Assistant engineer	6 00 per day	1,950 00	25 38	1,975 38
E. E. Kendell	Assistant engineer	6 00 per day	1,974 00	659 45	2,633 45
O. F. Lewis	Assistant engineer	6 00 per day	300 00	....	300 00
J. B. Maguire	Assistant engineer	6 00 per day	984 00	170 28	1,154 28
I. S. Matlaw	Assistant engineer	6 00 per day	954 00	171 03	1,125 03
C. L. McClelland	Assistant engineer	6 00 per day	822 00	....	822 00
E. P. Neuschwander	Assistant engineer	5 00 per day	445 00	....	445 00
Geo. I. Oakley	Assistant engineer	6 00 per day	1,908 00	613 82	2,521 82
B. W. Rosekrans	Assistant engineer	6 00 per day	336 00	....	336 00
W. J. Weigmann	Assistant engineer	6 00 per day	1,998 00	417 79	2,415 79
M. W. Williams	Assistant engineer	6 00 per day	1,572 00	328 56	1,900 56
W. R. Abbott	Leveler	4 50 per day	1,197 50	....	1,197 50
E. M. Babcock	Leveler	5 00 per day	1,640 00	....	1,640 00
T. S. Bailey	Leveler	5 00 per day	1,474 00	29 98	1,503 98
T. R. Bellows	Leveler	5 00 per day	1,620 00	580 62	2,200 62
J. S. Bixby	Leveler	4 50 per day	739 00	....	739 00
Otto Brown	Leveler	4 50 per day	1,071 00	....	1,071 00
C. R. De Graff	Leveler	5 00 per day	1,730 00	53 45	1,783 45
R. E. Drake	Leveler	4 50 per day	1,269 00	....	1,269 00
C. F. de Clerq	Leveler	5 00 per day	843 00	....	843 00
A. C. Eaton	Leveler	5 00 per day	995 00	....	995 00
I. A. Farquhar	Leveler	5 00 per day	1,266 50	22 60	1,289 10
J. M. Friedland	Leveler	5 00 per day	380 00	....	380 00
M. W. Grimes	Leveler	5 00 per day	1,595 00	....	1,595 00
C. L. Hayward	Leveler	5 00 per day	1,440 00	....	1,440 00
Eustace Hulsapple	Leveler	5 00 per day	1,625 00	....	1,625 00
Grant Huntley	Leveler	5 00 per day	1,645 00	....	1,645 00
A. D. Hyman	Leveler	4 50 per day	1,072 50	....	1,072 50
G. C. Ingersoll	Leveler	5 00 per day	1,475 50	....	1,475 50
G. H. Jones	Leveler	4 50 per day	1,203 50	....	1,203 50
C. I. Lansing	Leveler	5 00 per day	1,423 00	....	1,423 00
A. T. Madison	Leveler	4 50 per day	614 50	....	614 50
D. W. Overocker	Leveler	5 00 per day	1,554 50	....	1,554 50
C. G. Ranney	Leveler	5 00 per day	1,505 00	....	1,505 00
W. C. Rich	Leveler	4 50 per day	1,284 00	23 98	1,307 98
R. W. Smith	Leveler	4 50 per day	543 50	....	543 50
A. M. Snow	Leveler	4 50 per day	58 50	....	58 50
S. R. Tighe	Leveler	5 00 per day	885 00	....	885 00
C. E. Weed	Leveler	5 00 per day	830 00	27 12	857 12
W. E. Weller	Leveler	5 00 per day	470 00	24 65	494 65
L. H. M. Whitney	Leveler	5 00 per day	1,065 00	13 92	1,078 92
J. D. Williams	Leveler	5 00 per day	1,715 00	48 41	1,763 41
C. E. Anderson	Rodman	3 50 per day	931 00	....	931 00
W. W. Brown	Rodman	4 00 per day	1,203 00	....	1,203 00
L. R. Bennett	Rodman	3 50 per day	115 50	....	115 50
R. S. Bennett	Rodman	3 50 per day	190 50	....	190 50
Harold Bills	Rodman	3 50 per day	486 50	....	486 50
R. E. Demming	Rodman	4 00 per day	756 00	1 40	757 40
C. S. Dietz	Rodman	4 00 per day	1,256 00	....	1,256 00
J. A. Glominski	Rodman	4 00 per day	168 00	....	168 00
E. W. Goff	Rodman	4 00 per day	1,277 00	....	1,277 00
Ely Gamse	Rodman	3 50 per day	883 00	....	883 00
R. W. Heerlein	Rodman	3 50 per day	203 00	....	203 00
E. E. Hebert	Rodman	3 50 per day	112 00	....	112 00
H. W. Jewell	Rodman	4 00 per day	576 00	....	576 00
T. J. Loonie	Rodman	3 50 per day	1,084 00	....	1,084 00
S. C. Luce	Rodman	3 50 per day	112 00	....	112 00
L. Y. Meneely	Rodman	3 50 per day	1,018 50	....	1,018 50
A. D. Merrill	Rodman	3 50 per day	853 00	....	853 00
Chester Moore	Rodman	3 50 per day	91 00	....	91 00
A. R. Mulligan	Rodman	3 50 per day	1,031 00	....	1,031 00
W. N. Niles	Rodman	4 00 per day	1,163 50	....	1,163 50
H. P. O'Bryan	Rodman	3 50 per day	597 00	4 33	601 33

Construction of Barge Canal — Erie Canal —(Continued).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
S. M. Poutier	Rodman	$3 50 per day	$101 50		$101 50
H. J. Richardson	Rodman	4 00 per day	756 00	$205 77	961 77
Frank Roberts	Rodman	4 00 per day	260 00		260 00
Wm. Robinson	Rodman	3 50 per day	970 00		970 00
R. B. Smith	Rodman	4 00 per day	1,024 00		1,024 00
C. E. Smith	Rodman	3 50 per day	304 50		304 50
C. V. Smith	Rodman	3 50 per day	122 50		122 50
R. Shelley	Rodman	3 50 per day	553 00		553 00
Nial Sherwood	Rodman	3 50 per day	199 50		199 50
W. M. Steive	Rodman	3 50 per day	399 50		399 50
Geo. Van Nostrand	Rodman	4 00 per day	196 00		196 00
Bernard Wick	Rodman	3 50 per day	35 00		35 00
W. J. Willis	Rodman	3 50 per day	448 00		448 00
M. W. Wohlgemuth	Rodman	3 50 per day	572 50		572 50
H. C. Young	Rodman	3 50 per day	947 50		947 50
F. C. Armstrong	Chainman	3 00 per day	939 00	10 45	949 45
E. A. Blakeslee	Chainman	2 50 per day	255 00		255 00
Abraham Bloom	Chainman	2 50 per day	60 00		60 00
T. M. Brassel	Chainman	2 50 per day	159 00		159 00
J. G. Bushnell	Chainman	2 50 per day	405 00		405 00
H. V. Button	Chainman	2 50 per day	20 00		20 00
P. E. Collette	Chainman	2 50 per day	705 00		705 00
J. E. Cotter	Chainman	2 50 per day	15 00		15 00
J. L. Doyle	Chainman	3 00 per day	875 50		875 50
H. F. Eagan	Chainman	3 00 per day	507 00		507 00
F. B. Faille	Chainman	2 50 per day	355 00		355 00
F. E. Gillen	Chainman	3 00 per day	981 00		981 00
W. M. Griffith	Chainman	3 00 per day	993 00		993 00
Jacob Gadlowitz	Chainman	2 50 per day	107 50		107 50
H. H. Giles	Chainman	2 50 per day	7 50		7 50
A. O. Hollenbeck	Chainman	3 00 per day	945 50		945 50
Joseph Helfand	Chainman	2 50 per day	272 50		272 50
Raymond Jerrell	Chainman	3 00 per day	948 00		948 00
J. A. Kelley	Chainman	2 50 per day	307 50		307 50
R. L. Kelley	Chainman	2 50 per day	105 00		105 00
A. A. Laughlin	Chainman	3 00 per day	929 50		929 50
G. H. Leet	Chainman	2 50 per day	57 50		57 50
John Lyons	Chainman	2 50 per day	215 00		215 00
J. J. MacDonald	Chainman	2 50 per day	197 50		197 50
W. H. MacMahon	Chainman	2 50 per day	740 00		740 00
J. T. Phalan	Chainman	2 50 per day	192 50		192 50
L. G. Purday	Chainman	2 50 per day	202 50		202 50
G. R. Rankin	Chainman	2 50 per day	372 50		372 50
Jacob Rubin	Chainman	2 50 per day	600 00		600 00
T. D. Simpson	Chainman	3 00 per day	3 00		3 00
F. B. Stoddard	Chainman	3 00 per day	837 00		837 00
E. N. Scott	Chainman	2 50 per day	270 00		270 00
F. T. Sheldon	Chainman	2 50 per day	75 00		75 00
J. B. Sullivan	Chainman	2 50 per day	248 00		248 00
F. L. Teall	Chainman	3 00 per day	969 00		969 00
C. B. Tebo	Chainman	3 00 per day	946 50		946 50
J. R. Tighe	Chainman	3 00 per day	990 00		990 00
H. J. Waldvogel	Chainman	3 00 per day	803 00		803 00
C. A. Wilbur	Chainman	3 00 per day	951 00		951 00
R. G. Williams	Chainman	2 50 per day	698 50		698 50
J. A. Young	Chainman	3 00 per day	948 00		948 00
A. M. Wait	Inspector of public works	5 00 per day	1,700 00		1,700 00
E. V. Allendorph	Inspector of masonry	5 00 per day	985 00		985 00
W. W. Barclay	Inspector of masonry	5 00 per day	285 00		285 00
J. A. Cahalin	Inspector of masonry	4 50 per day	1,279 00		1,279 00
J. O. Donnelly	Inspector of masonry	4 00 per day	24 00		24 00
T. F. Fagan	Inspector of masonry	5 00 per day	1,040 00		1,040 00
H. B. Finan	Inspector of masonry	4 50 per day	1,471 50		1,471 50
W. H. H. Klinkhart	Inspector of masonry	5 00 per day	1,564 50		1,564 50
H. L. Kennedy	Inspector of masonry	4 00 per day	768 00		768 00
C. M. Leet	Inspector of masonry	5 00 per day	477 00		477 00
W. P. Lynch	Inspector of masonry	5 00 per day	1,226 00		1,226 00
S. Y. MacGregor	Inspector of masonry	5 00 per day	1,611 50		1,611 50
J. E. Magowan	Inspector of masonry	3 50 per day	115 50		115 50
T. M. Oliver	Inspector of masonry	5 00 per day	1,581 50		1,581 50
James Sim	Inspector of masonry	5 00 per day	1,205 00		1,205 00
J. M. Taylor	Inspector of masonry	4 50 per day	337 50		337 50
M. V. McCoy	Foreman of borings	3 00 per day	154 00		154 00
J. H. Dolan	Boatman	3 00 per day	690 00		690 00

Construction of Barge Canal — Erie Canal — (Continued).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
E. A. Faille	Boatman	$3 00 per day	$1,002 00	$16 60	$1,018 60
W. L. Gillette	Boatman	3 00 per day	177 00		177 00
James Lair	Boatman	3 00 per day	1,011 00		1,011 00
W. H. Turnbull	Boatman	3 00 per day	141 00		141 00
F. S. Belotti	Laborer	2 00 per day	628 00		628 00
William Bird	Laborer	2 00 per day	632 00		632 00
F. A. Boltwood	Laborer	2 00 per day	642 00		642 00
Chas. Chant	Laborer	2 00 per day	40 00		40 00
W. F. Clayton	Laborer	2 00 per day	52 00		52 00
Thomas Collins	Laborer	2 00 per day	148 00		148 00
H. R. Davidson	Laborer	2 00 per day	180 00		180 00
R. A. Donaldson	Laborer	2 00 per day	640 00		640 00
M. Dorsch	Laborer	2 00 per day	60 00		60 00
John Eagan	Laborer	2 00 per day	86 00		86 00
William Fader	Laborer	2 00 per day	464 00		464 00
W. M. Francis	Laborer	2 00 per day	330 00		330 00
William Gass	Laborer	2 00 per day	644 00		644 00
C. K. Gavin	Laborer	2 00 per day	96 00		96 00
W. L. Gillette	Laborer	2 00 per day	68 00		68 00
Chas. H. Goeltz	Laborer	2 00 per day	44 00		44 00
J. C. Hayes	Laborer	2 00 per day	630 00		630 00
T. A. Keane	Laborer	2 00 per day	700 00		700 00
F. R. Kimmey	Laborer	2 00 per day	96 00		96 00
John Lavery	Laborer	2 00 per day	730 00		730 00
Edward Lower	Laborer	2 00 per day	130 00		130 00
Edgar Lynd	Laborer	2 00 per day	690 00		690 00
Matthew McConnell	Laborer	2 00 per day	662 00		662 00
Henry MacFarlane	Laborer	2 00 per day	48 00		48 00
W. H. Moulton	Laborer	2 00 per day	90 00		90 00
Leonard Paige	Laborer	2 00 per day	314 00		314 00
Samuel Schwartz	Laborer	2 00 per day	44 00		44 00
W. H. Turnbull	Laborer	2 00 per day	176 00		176 00
Melvin Van Slyke	Laborer	2 00 per day	8 00		8 00
William Wolf	Laborer	2 00 per day	702 00		702 00
L. R. Ames	Axeman and office assistant	2 00 per day	100 00		100 00
A. J. Banker	Axeman and office assistant	2 00 per day	334 00		334 00
Alexander Bayly	Axeman and office assistant	2 00 per day	656 00		656 00
E. L. Bennett	Axeman and office assistant	2 00 per day	636 00		636 00
W. A. Dawson	Axeman and office assistant	2 00 per day	636 00		636 00
Pinces Greenbaum	Axeman and office assistant	2 00 per day	112 00		112 00
Wm. Heinman, Jr	Axeman and office assistant	2 00 per day	4 00		4 00
E. B. Hollenbeck	Axeman and office assistant	2 00 per day	638 00		638 00
J. P. Hughes	Axeman and office assistant	2 00 per day	198 00		198 00
William Mahoney	Axeman and office assistant	2 00 per day	100 00		100 00
William Mangan	Axeman and office assistant	2 00 per day	626 00		626 00
J. H. McEntee, Jr	Axeman and office assistant	2 00 per day	64 00		64 00
R. V. O'Brien	Axeman and office assistant	2 00 per day	6 00		6 00
D. I. O'Leary	Axeman and office assistant	2 00 per day	8 00		8 00
A. Rothberg	Axeman and office assistant	2 00 per day	52 00		52 00
W. C. Ruland	Axeman and office assistant	2 00 per day	84 00		84 00
L. E. Thompson	Axeman and office assistant	2 00 per day	636 00		636 00
H. J. Weir	Axeman and office assistant	2 00 per day	176 00		176 00
G. J. Abel	Gage reader	7 00 per month	84 00		84 00
Godfrey Aman	Gage reader	7 00 per month	84 00		84 00
C. V. Barrett	Gage reader	5 00 per month	60 00		60 00
William Butler	Gage reader	7 00 per month	84 00		84 00
Henry Edick, Jr	Gage reader	7 00 per month	77 00		77 00
John Fernald	Gage reader	5 00 per month	60 00		60 00
C. H. Fitch	Gage reader	7 00 per month	77 00		77 00
Harrison Fitch	Gage reader	7 00 per month	7 00		7 00
G. W. Flansburg	Gage reader	7 00 per month	84 00		84 00
J. J. Gilbert	Gape reader	3 00 per month	27 00		27 00
J. D. Hambrecht	Gage reader	7 00 per month	84 00		84 00
H. M. Hoag	Gage reader	5 00 per month	60 00		60 00
E. L. Hoffman	Gage reader	7 00 per month	8 63		8 63
Lloyd Kast	Gage reader	5 00 per month	60 00		60 00
Frank McArthur	Gage reader	7 00 per month	84 00		84 00
J. B. Mackey	Gage reader	7 00 per month	56 00		56 00
R. S. Marshall	Gage reader	7 00 per month	56 00		56 00
A. W. Nelson	Gage reader	7 00 per month	49 00		49 00
E. J. Nelson	Gage reader	7 00 per month	35 00		35 00
P. C. Pickard	Gage reader	7 00 per month	56 00		56 00
J. Reepmeyer, Jr	Gage reader	10 00 per month	93 00		93 00
John Schmeltz	Gage reader	3 00 per month	9 00		9 00

Construction of Barge Canal — Erie Canal — (Concluded).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
A. M. Spencer	Gage reader	$7 00 per month	$49 00	....	$49 00
John Stark	Gage reader	7 00 per month	56 00	....	56 00
W. C. Vrooman	Gage reader	7 00 per month	56 00	....	56 00
Minnie E. Wheeler	Gage reader	7 00 per month	84 00	....	84 00
W. J. Wick	Gage reader	10 00 per month	84 37	....	84 37
Robert Wilson	Gage reader	6 00 per month	72 00	....	72 00
C. W. Young	Gage reader	14 00 per month	140 00	....	140 00
W. E. Young	Gage reader	7 00 per month	56 00	....	56 00
			$172,888 71	$8,109 61	$180,998 32

Incidental Expenses.

Instruments, tools and appliances	$223 54	
Office rent	1,785 38	
Fuel and light	560 90	
Stationery and printing	210 27	
Postage	204 61	
Telephone and telegraph	1,199 24	
Miscellaneous	12,942 77	
		17,126 71
Total		$198,125 03

Construction of Barge Canal — Champlain Canal.

Chapter 147, Laws of 1903, and amendatory laws.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Geo. D. Williams	Division engineer	$4,200 per year	$116 66	$347 90	$464 56
J. A. O'Connor	First resident engineer	3,000 per year	1,281 13	514 16	1,795 29
James Burden	Resident engineer	2,400 per year	445 16	5 30	450 46
D. B. La Du	Resident engineer	2,400 per year	2,244 00	1,458 61	3,702 61
E. V. R. Payne	Resident engineer	2,700 per year	2,625 00	165 47	2,790 47
F. N. Sanders	Resident engineer	3,000 per year	2,925 00	398 47	3,323 47
H. E. Brainard	Bridge designer	175 per month	401 82	111 56	513 38
R. D. Parsons	Financial clerk	150 per month	280 00	....	280 00
Parkes D. Wendell	Estimate clerk	200 per month	600 00	....	600 00
L. H. Hurd	Clerk	112 50 per month	900 00	....	900 00
Hattie A. Dell	Stenographer	100 per month	200 00	....	200 00
Bertha E. Kirchner	Stenographer	60 per month	7 74	....	7 74
Georgina Pflaum	Stenographer	75 per month	737 50	....	737 50
J. E. Phinney, Jr.	Stenographer	75 per month	900 00	....	900 00
Lottie Jones	Temporary stenographer	50 per month	91 66	....	91 66
D. E. Damon	Engineering draftsman	5 00 per day	1,568 00	....	1,568 00
J. A. Galvin	Engineering draftsman	5 00 per day	261 00	....	261 00
F. B. Holmes	Engineering draftsman	5 00 per day	1,660 00	....	1,660 00
J. E. Hall	Engineering draftsman	4 50 per day	1,453 50	....	1,453 50
R. W. Scott	Tracer	75 per month	900 00	....	900 00
I. L. Stalker	Tracer	75 per month	900 00	....	900 00
S. W. Belding	Assistant engineer	6 00 per day	1,860 00	440 69	2,300 69
W. C. Benedict	Assistant engineer	6 00 per day	1,800 00	549 82	2,349 82
F. S. Crowell	Assistant engineer	6 00 per day	516 00	47 60	563 60
C. A. Curtis	Assistant engineer	6 00 per day	2,142 00	243 15	2,385 15
W. J. Durkin	Assistant engineer	5 00 per day	235 00	....	235 00
H. W. Hale	Assistant engineer	6 00 per day	996 00	159 23	1,155 23
R. D. Hayes	Assistant engineer	6 00 per day	2,016 00	152 26	2,168 26
L. T. Howard	Assistant engineer	6 00 per day	2,106 00	158 21	2,264 21
Fred C. Koerner	Assistant engineer	6 00 per day	895 50	26 75	922 25
C. L. McClelland	Assistant engineer	6 00 per day	1,152 00	139 89	1,291 89
E. L. Olcott	Assistant engineer	5 00 per day	78 00	....	78 00
A. C. Richards	Assistant engineer	6 00 per day	2,076 00	56 57	2,132 57
B. W. Rosecrans	Assistant engineer	6 00 per day	1,458 00	3 95	1,461 95
Harry Shoemaker	Assistant engineer	6 00 per day	1,344 00	211 63	1,555 63
W. B. Watson	Assistant engineer	6 00 per day	2,034 00	502 58	2,536 58
E. W. Wendell	Assistant engineer	5 00 per day	1,404 00	137 16	1,541 16
R. N. Barrett	Leveler	4 50 per day	1,032 50	....	1,032 50

Construction of Barge Canal — Champlain Canal —(Cont'd).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
W. C. Bratton	Leveler	$4 50 per day	$1,327 50		$1,327 50
W. L. Caler	Leveler	4 50 per day	1,503 00		1,503 00
M. D. Ewell	Leveler	4 50 per day	400 50		400 50
J. B. Foote	Leveler	5 00 per day	1,615 00		1,615 00
R. G. Gibson	Leveler	5 00 per day	1,625 00		1,625 00
J. C. Gotwals	Leveler	5 00 per day	720 00	$87 75	807 75
Ely Gamse	Leveler	4 50 per day	257 50		257 50
J. A. Glominski	Leveler	4 50 per day	94 50		94 50
W. T. Hunt	Leveler	5 00 per day	1,755 00		1,755 00
C. L. Hayward	Leveler	4 50 per day	67 50		67 50
E. H. Hussey	Leveler	4 50 per day	72 00		72 00
B. T. Kenyon	Leveler	4 50 per day	1,491 50		1,491 50
John McBride	Leveler	5 00 per day	1,565 00		1,565 00
A. R. Morse	Leveler	5 00 per day	1,474 50	7 00	1,481 50
S. T. Rickard	Leveler	5 00 per day	1,574 00		1,574 00
A. M. Snow	Leveler	4 50 per day	202 50		202 50
J. B. Whipple	Leveler	4 50 per day	382 50		382 50
J. L. Ames	Rodman	3 50 per day	721 00		721 00
H. L. Clark	Rodman	4 00 per day	1,256 00		1,256 00
C. M. Colony	Rodman	4 00 per day	1,340 00		1,340 00
F. J. Doerhoefer	Rodman	4 00 per day	1,396 00		1,396 00
H. F. Hills	Rodman	3 50 per day	147 00		147 00
R. W. Heerlein	Rodman	3 50 per day	147 00		147 00
F. B. Hall	Rodman	3 50 per day	904 00		904 00
H. R. Leland	Rodman	3 50 per day	182 00		182 00
A. T. Madison	Rodman	3 50 per day	311 50		311 50
Mott Palmer	Rodman	3 50 per day	469 00		469 00
H. J. Richardson	Rodman	4 00 per day	676 00	150 45	826 45
Frank Roberts	Rodman	4 00 per day	52 00		52 00
R. B. Smith	Rodman	4 00 per day	248 00		248 00
C. E. Smith	Rodman	3 50 per day	49 00		49 00
R. W. Smith	Rodman	3 50 per day	308 00		308 00
Edward Schramm	Rodman	3 50 per day	416 50		416 50
W. M. Stine	Rodman	3 50 per day	248 50		248 50
W. D. Zeilly	Rodman	3 50 per day	91 00		91 00
H. A. Born	Chainman	2 50 per day	152 50		152 50
W. M. Bronk	Chainman	3 00 per day	1,032 50		1,032 50
E. F. Dossert	Chainman	2 50 per day	340 00		340 00
C. H. Farnam	Chainman	2 50 per day	60 00		60 00
Jacob Gadlowits	Chainman	2 50 per day	360 00		360 00
J. P. Kivlen	Chainman	2 50 per day	650 00		650 00
H. S. Miller	Chainman	3 00 per day	549 00		549 00
J. L. Scharf	Chainman	2 50 per day	317 50		317 50
F. B. Stoddard	Chainman	3 00 per day	135 00		135 00
A. E. Wood	Chainman	3 00 per day	240 00		240 00
R. E. Bierce	Inspector of masonry	3 50 per day	227 50		227 50
J. A. Cahlin	Inspector of masonry	4 50 per day	193 50		193 50
L. W. Donnelly	Inspector of masonry	5 00 per day	1,665 00		1,665 00
J. O. Donnelly	Inspector of masonry	4 00 per day	44 00		44 00
F. B. Craft	Inspector of masonry	5 00 per day	1,399 00	95	1,399 95
F. G. Tilton	Inspector of masonry	5 00 per day	1,531 50		1,531 50
J. H. Dolan	Boatman	3 00 per day	141 00		141 00
E. A. Faille	Boatman	3 00 per day	12 00	14 12	26 12
W. K. Smith	Boatman	3 00 per day	993 00		993 00
Louis Case	Laborer	2 00 per day	506 00		506 00
F. P. Duffy	Laborer	2 00 per day	134 00		134 00
J. J. Finn	Laborer	2 00 per day	314 00		314 00
Harry La France	Laborer	2 00 per day	370 00		370 00
J. F. Landrigan	Laborer	2 00 per day	44 00		44 00
Henry MacFarlane	Laborer	2 00 per day	104 00		104 00
N. H. McHerd	Laborer	2 00 per day	730 00		730 00
C. B. McMasters	Laborer	2 00 per day	668 00		668 00
H. H. McMasters	Laborer	2 00 per day	58 00		58 00
Leonard Paige	Laborer	2 00 per day	206 00		206 00
F. S. Ray	Laborer	2 00 per day	140 00		140 00
N. D. Richardson	Laborer	2 00 per day	314 00		314 00
John Rock	Laborer	2 00 per day	708 00		708 00
Edward Wendell	Laborer	2 00 per day	662 00		662 00
Fred Williams	Laborer	2 00 per day	624 00		624 00
Byron Houghtaling	Axeman and office assistant	2 00 per day	694 00		694 00
W. A. Maloney	Axeman and office assistant	2 00 per day	80 00		80 00
N. D. Morey	Axeman and office assistant	2 00 per day	488 00		488 00
D. I. O'Leary	Axeman and office assistant	2 00 per day	230 00		230 00
J.J. Raup	Axeman and office assistant	2 00 per day	704 00		704 00

Construction of Barge Canal — Champlain Canal — (Concl'd).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
G. A. Rogers	Axeman and office assistant	$2 00 per day	$70 00		$70 00
Thos. Ryan, Jr.	Axeman and office assistant	2 00 per day	614 00		614 00
H. J. Weir	Axeman and office assistant	2 00 per day	502 00		502 00
E. H. Bowker	Gage reader	7 00 per month	56 00		56 00
L. C. Brazier	Gage reader	12 00 per month	144 00		144 00
F. E. Chapman	Gage reader	5 00 per month	60 00		60 00
T. L. Cluett	Gage reader	7 00 per month	56 00		56 00
J. H. Donnelly	Gage reader	7 00 per month	84 00		84 00
W. E. Downing	Gage reader	7 00 per month	84 00		84 00
W. B. Dunston	Gage reader	7 00 per month	84 00		84 00
A. B. Fisher	Gage reader	7 00 per month	56 00		56 00
H. C. Funston	Gage reader	7 00 per month	84 00		84 00
George Hammond	Gage reader	7 00 per month	84 00		84 00
Karl Herzog, Jr.	Gage reader	5 00 per month	40 97		40 97
T. E. Hickey	Gage reader	8 00 per month	85 00		85 00
W. D. La Bar	Gage reader	7 00 per month	66 50		66 50
Howard May	Gage reader	5 00 per month	15 00		15 00
Benjamin Metcalf	Gage reader	7 00 per month	73 73		73 73
R. S. Metcalf	Gage reader	7 00 per month	10 27		10 27
T. B. Sanders	Gage reader	7 00 per month	84 00		84 00
James Steen	Gage reader	7 00 per month	17 50		17 50
B. F. Thebo	Gage reader	7 00 per month	84 00		84 00
H. C. Tinker	Gage reader	7 00 per month	84 00		84 00
			$89,093 14	$6,091 23	$95,184 37
	Incidental Expenses.				
Instruments, tools and appliances				$224 00	
Office rent				851 50	
Fuel and light				334 96	
Stationery and printing				111 45	
Postage				140 79	
Telephone and telegraph				539 90	
Miscellaneous				4,173 24	
					6,375 84
Total					$101,560 21

Bureau of Bridges.

Chapter 433, Laws of 1909; chapter 513, Laws of 1910.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Wm. R. Davis	Chief bridge designer	$375 per month	$619 89		$619 89
John Bartholomew	Bridge designer	175 per month	22 58		22 58
H. E. Brainard	Bridge designer	150 per month	5 36		5 36
J. C. Green	Bridge designer	175 per month	58 33		58 33
C. N. Haggart	Bridge designer	175 per month	45 91		45 91
A. G. Hayden	Bridge designer	175 per month	46 67		46 67
H. D. Miller	Bridge designer	175 per month	71 71		71 71
J. L. Southworth	Engineering draftsman	5 00 per day	152 00		152 00
J. A. Jensen	Mechanical draftsman	100 per month	43 12		43 12
E. J. Doyle	Assistant engineer	6 00 per day	156 00		156 00
R. B. Allen	Tracer	50 per month	50 00		50 00
Bernard Gasier	Tracer	75 per month	70 00		70 00
Charles Messina	Tracer	60 per month	60 00		60 00
Leroy Bamer	Axeman and office assistant	2 00 per day	52 00		52 00
Total			$1,453 57		$1,453 57

Examination of Monuments and Maps.

Chapter 433, Laws of 1909; chapter 513, Laws of 1910.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
H. W. De Graff	Deputy state engineer	$5,000 per year		$87 46	$87 46
P. W. O'Grady	Assistant engineer	6 00 per day	$342 00	409 31	751 31
A. T. O'Leary	Assistant engineer	6 00 per day	797 00	1,097 49	1,894 49
Ely Gamse	Rodman	4 00 per day	28 00		28 00
H. J. Stabile	Rodman	4 00 per day	104 00	71 77	175 77
H. F. Eagan	Chainman	3 00 per day	270 00	4 60	274 60
Jacob Rubin	Chainman	2 50 per day	17 50	4 70	22 20
R. G. Williams	Chainman	2 50 per day	17 50	4 70	22 20
Chas. Beaujon	Laborer	2 00 per day	10 00		10 00
Thomas Davison	Laborer	2 00 per day	232 00		232 00
E. C. Finkle	Laborer	2 00 per day	6 00		6 00
Henry Gobert	Laborer	2 00 per day	30 00		30 00
J. Harrington	Laborer	2 00 per day	242 00		242 00
L. A. Hequembourg	Laborer	2 00 per day	202 00		202 00
Joseph Joray	Laborer	2 00 per day	32 00		32 00
George Loucks	Laborer	2 00 per day	14 00		14 00
M. H. McConnell	Laborer	2 00 per day	44 00		44 00
Henry McIntyre	Laborer	2 00 per day	168 00		168 00
Elmile Mettes	Laborer	2 00 per day	10 00		10 00
M. Monahan	Laborer	2 00 per day	90 00		90 00
L. C. Pelton	Laborer	2 00 per day	126 00		126 00
John Redmond	Laborer	2 00 per day	14 00		14 00
D. C. Schillings	Laborer	2 00 per day	152 00		152 00
F. C. Batt	Automobile driver	100 per month	6 45	10 15	16 60
			$2,954 45	$1,690 18	$4,644 63
Incidental Expenses.					
Livery				$1,486 75	
Stationery and printing				3 48	
Postage				10 69	
Telephone and telegraph				14 90	
Miscellaneous				249 37	
					1,765 19
Total					$6,409 82

Surveys for State Court of Claims.

Chapter 578, Laws of 1907; chapter 433, Laws of 1909.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
J. A. O'Connor	First resident engineer	$3,000 per year	$44 64		$44 64
R. E. Horton	Resident engineer	3,000 per year		$22 81	22 81
A. P. Mussi	Engineering draftsman	4 50 per day	31 50	14 74	46 24
H. A. Gehring	Assistant engineer	5 50 per day	143 00		143 00
D. R. Lee	Assistant engineer	6 00 per day	6 00	1 40	7 40
J. B. Maguire	Assistant engineer	6 00 per day	66 00	16 98	82 98
J. P. Newton	Assistant engineer	6 00 per day	18 00		18 00
Geo. I. Oakley	Assistant engineer	6 00 per day	12 00	16 85	28 85
A. C. Eaton	Leveler	5 00 per day	45 00	4 75	49 75
M. D. Ewell	Leveler	4 50 per day	22 50		22 50
C. A. Lansing	Leveler	4 50 per day	22 50		22 50
C. G. Ranney	Leveler	5 00 per day	60 00		60 00
C. H. Hurley	Rodman	3 50 per day	10 50		10 50
J. L. Ames	Chainman	2 50 per day	10 00		10 00
H. V. Button	Chainman	2 50 per day	22 50		22 50
W. H. MacMahon	Chainman	2 50 per day	12 50		12 50
Karl Moulton	Chainman	2 50 per day	7 50		7 50

Surveys for State Court of Claims — (Continued).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
E. C. Niles	Chainman	$3 00 per day	$18 00	....	$18 00
N. B. Robbins	Chainman	2 50 per day	15 00	....	15 00
C. A. Wilbur	Chainman	3 00 per day	15 00	....	15 00
M. W. Wohlgemuth	Chainman	3 00 per day	18 00	....	18 00
Wm. A. Dawson	Axeman and office assistant	2 00 per day	8 00	....	8 00
			$608 14	$77 53	$685 67
	Incidental Expenses.				
Livery				$7 50	
Miscellaneous				18 22	
					25 72
Total					$711 39

Mapping Canal Lands.

Chapter 199, Laws of 1910.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
G. L. Schillner	Engineering draftsman	$5 00 per day	$15 00	....	$15 00
Edwin Hilborn	Assistant engineer	6 00 per day	618 00	$112 09	730 09
E. C. Olcott	Assistant engineer	6 00 per day	348 00	....	348 00
C. H. Hurley	Rodman	4 00 per day	420 00	....	420 00
C. E. Smith	Rodman	3 50 per day	45 50	....	45 50
Bernard Wich	Rodman	3 50 per day	59 50	....	59 50
W. J. Bissell	Chainman	2 50 per day	192 50	....	192 50
C. E. Deutchbein	Chainman	2 50 per day	65 00	....	65 00
E. E. Hebert	Chainman	2 50 per day	2 50	....	2 50
E. C. Neudecker	Chainman	2 50 per day	165 00	....	165 00
Geo. Terwilliger	Chainman	2 50 per day	27 50	....	27 50
R. E. Leonard	Laborer	2 00 per day	210 00	....	210 00
			$2,168 50	$112 09	$2,280 59
	Incidental Expenses.				
Telephone and telegraph				$0 30	
Miscellaneous				42 80	
					43 10
Total					$2,323 69

Topographic Survey.

Chapter 433, Laws of 1909; chapter 513, Laws of 1910.

In Coöperation with United States Geological Survey.

R. H. Babcock	$151 00
D. H. Baldwin	197 50
William Bendfield	33 00
P. C. Bintz	29 50
E. H. Collester	72 00
Melvin Company	22 00
C. E. Cook	766 95
F. W. Crisp	85 42
R. D. Cummings	233 11
G. C. Curtis	81 50
J. A. Daniels	96 50
Director U. S. Geological Survey	67 44
A. E. Dixon	57 00

Topographic Survey — (Continued).

H. L. Dodge	$73 50
George Farney	22 00
Peter Flavin	155 00
S. P. Floore	362 40
J. I. Gayetty	388 84
S. A. Graham	106 50
H. E. Hawkinson	81 50
E. J. Hawley	43 25
J. A. Jipson	18 00
A. J. Kavanaugh	81 50
G. T. Kidder	15 75
J. H. Lee Feaver	218 34
J. A. Magra	22 00
Harvey Malcolm	86 50
C. O. McAllaster	63 25
J. F. McBeth	229 63
R. C. McKinney	462 05
A. F. McNair	105 00
J. J. McNulta	283 50
H. Mellinger	47 50
Lamont Monnat	22 00
W. H. S. Morey	30 80
Geo. Nertz	23 00
S. P. Niles	34 00
I. W. Petit	105 00
C. J. Powers	96 50
Ira Quimby, Jr	123 33
James Rayburn	111 50
Karl E. Schlachter	346 00
C. H. Semper	3 19
H. S. Senseney	94 25
F. L. Shalibo	81 50
Perley Shampine	208 95
C. R. Short	19 50
William Smith	24 00
E. O. Swedberg	72 92
F. M. White	144 83
J. M. Whitman, Jr	976 57
G. H. Wright	60 00
W. D. Young	66 50
J. D. Zehr	66 50
Total	$7,469 77

Hydrographic Survey.

Chapter 433, Laws of 1909; chapter 513, Laws of 1910.

In Coöperation with United States Geological Survey.

Lester Allen	$57 17
L. B. Babcock	5 00
G. E. Carman	62 83
E. W. Coe	4 93
Edward Conron	7 50
C. C. Covert	286 14
O. A. Gates	12 00
J. V. Henry	44 00
Percy Howe	10 00
W. G. Hoyt	330 01
W. A. James	262 50
J. H. La Rue	36 00
Mrs. Wm. Morgan	11 23
D. L. Orcutt	39 60
J. J. Phelan	76 91
C. S. Rolles	24 00
Mrs. Vashti Russell	6 53
Lester Sevarie	36 00
H. L. Smith	60 00
Jewett Snyder	24 00
Mrs. C. A. Waitt	30 00
Total	$1,426 35

SUMMARY.

The foregoing tables are summarized as follows:

Ordinary Repairs to Canals.

1.	Erie canal, chapter 432, Laws of 1909	$7,992	28
2.	Champlain canal, chapter 432, Laws of 1909	4,007	72

Construction of Barge Canal.

3.	Head office account, chapter 147, Laws of 1903; chapter 195, Laws of 1909	281,355	73
4.	Erie canal, chapter 147, Laws of 1903; chapter 195, Laws of 1909	198,125	03
5.	Champlain canal, chapter 147, Laws of 1903; chapter 195, Laws of 1909	101,560	21

Bureau of Bridges.

6.	Bureau of bridges, chapter 433, Laws of 1909; chapter 513, Laws of 1910	1,453	57

Special Surveys.

7.	Examination of monuments and maps, chapter 433, Laws of 1909; chapter 513, Laws of 1910	6,409	82
8.	Surveys for State Court of Claims, chapter 578, Laws of 1907; chapter 433, Laws of 1909	711	39
9.	Mapping canal lands, chapter 199, Laws of 1910	2,323	69
10.	Topographic survey, chapter 433, Laws of 1909; chapter 513, Laws of 1910	7,469	77
11.	Hydrographic survey, chapter 433, Laws of 1909; chapter 513, Laws of 1910	1,426	35
	Total	$612,835	56

TABLE OF CONTRACTS COMPLETED ON THE EASTERN DIVISION DURING THE FISCAL YEAR ENDED SEPTEMBER 30, 1910.

Construction of Barge Canal.

Chapter 147, Laws of 1903, and amendatory laws.

CONTRACTOR	Date of contract.	Character of work.	Engineer's preliminary estimate.	Contract price, as affected by alterations.	Final payment.
Groton Bridge Company..........	Aug. 10, 1906	Contract No. 7, Erie and Champlain canals — Bridges on Contracts Nos. 2 and 3..............................	$33,576 60	$31,637 60	$30,683 16
Lake Erie Dredging Company.....	April 6, 1908	Contract No. 26, Champlain canal — Hudson river near Fort Edward......................................	60,225 00	40,057 00	35,443 24

TABLE OF CONTRACTS PENDING ON THE EASTERN DIVISION, SEPTEMBER 30, 1910.

Construction of Barge Canal.

Chapter 147, Laws of 1903, and amendatory laws.

CONTRACTOR.	Date of contract.	Character of work.	Engineer's preliminary estimate.	Contract price, as affected by alterations.	Payments to September 30, 1910.
Empire Engineering Corporation	April 18, 1905	Contract No. 1, Champlain canal — Hudson river, Northumberland to Fort Miller and Crocker's Reef to Fort Edward	$619,846 00	$580,423 57	$471,620 00
Ferguson Contracting Co	April 3, 1905	Contract No. 2, Erie canal — Through Waterford to Contract No. 11	1,022,640 00	950,506 00	694,390 00
†Holler & Shepard	Dec. 8, 1909	Contract No. 2-E, Erie canal — Through Waterford to Contract No. 11	263,189 40	266,067 70	137,560 00
Sundstrom & Stratton	April 4, 1905	Contract No. 3, Champlain canal — Fort Miller to Crocker's Reef	760,576 00	657,273 09	633,290 00
Pittsburg-Eastern Co	May 22, 1906	Contract No. 8, Erie canal — Dams and locks at Scotia, Rotterdam and Cranesville	1,518,382 00	1,516,788 98	824,550 00
Fort Orange Construction Co	May 21, 1906	Contract No. 11, Erie canal — From Contract No. 2 to Mohawk river	1,671,385 00	1,355,941 40	975,830 00
Penn Bridge Co	Nov. 7, 1908	Contract No. 13, Erie canal — Bridges on Contract No. 18	12,303 50	10,170 20	9,170 00
Acme Engineering and Contracting Co	Sept. 10, 1907	Contract No. 14, Erie canal — Mohawk river, Crescent to Rexford Flats aqueduct; dams at Crescent and Mindenville; dams and locks at Vischer's Ferry, Canajoharie, Yosts and Fort Plain	2,875,570 00	2,966,815 20	1,948,800 00
Atlantic, Gulf & Pacific Co	Aug. 9, 1906	Contract No. 15, Champlain canal — Whitehall to Comstock	1,380,760 00	1,477,216 75	1,091,040 00
United Construction Co	Dec. 20, 1906	Contract No. 16, Erie and Champlain canals — Bridges on Contracts Nos. 11, 25 and 27	70,719 00	69,076 95	5,380 00
The Scofield Co	Dec. 29, 1906	Contract No. 17, Erie canal — Dams and locks at Amsterdam and Tribes Hill	883,926 00	842,613 28	57,560 00
†Alexander Murdoch	Mar. 3, 1908		836,220 76	812,286 46	560,890 00
Kelley Bros. Contracting Co	Dec. 28, 1906	Contract No. 18, Erie canal — Mindenville to Castle creek	785,980 00	856,251 59	456,020 00
Houston Barnard	Aug. 20, 1909	Contract No. 20-A, Erie canal — Little Falls to Castle creek	499,000 00	490,592 50	41,730 00
S. Pearson & Son, Inc	Aug. 2, 1909	Contract No. 20-B, Erie canal — Mohawk river, Mindenville to Canajoharie	848,540 00	933,194 00	9,260 00
American Pipe and Construction Co.	Aug. 18, 1909	Contract No. 20-C, Erie canal — Mohawk river, Canajoharie to Yosts	570,600 00	585,720 00	7,640 00
American Pipe & Construction Co.	Aug. 18, 1909	Contract No. 20-D, Erie canal — Mohawk river, Yosts to Rexford Flats	2,260,000 00	2,681,040 40	0

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† Contract relet.

TABLE OF CONTRACTS PENDING ON THE EASTERN DIVISION, SEPTEMBER 30, 1910 — (*Continued*).

Construction of Barge Canal — (Continued).

CONTRACTOR.	Date of contract.	Character of work.	Engineer's preliminary estimate.	Contract price, as affected by alterations.	Payments to September 30, 1910.
Atlantic, Gulf & Pacific Co.	Nov. 19, 1906	Contract No. 25, Champlain canal — Comstock to Dunhams Basin	$1,849,831 00	$1,691,819 00	$1,201,160 00
Kinser Construction Co.	Nov. 23, 1906	Contract No. 27, Champlain canal — Dunhams Basin to Fort Edward	998,920 00	723,268 61	378,650 00
Maryland Dredging & Contracting Co.	April 3, 1909	Contract No. 29, Erie canal — Sterling creek to Herkimer-Oneida county line	812,350 00	676,700 66	166,760 00
Acme Engineering & Contracting Co.	July 16, 1909	Contract No. 30, Erie canal — Mohawk river, Little Falls to Sterling creek	2,650,500 00	2,591,867 75	212,880 00
Casey & Murray	Sept. 2, 1908	Contract No. 31, Erie canal — Through Little Falls; Rocky Rift dam	813,800 00	831,391 78	475,440 00
Penn Bridge Co.	April 19, 1909	Contract No. 32, Champlain canal — Lock-gates, etc., on Contracts Nos. 3, 25 and 27	59,820 00	46,797 00	42,530 00
Penn Bridge Co.	Jan. 7, 1910	Contract No. 33, Erie and Champlain canals — Lock-gates, etc., on Contracts Nos. 2, 11 and 15	137,155 36	149,252 81	0
J. D. Miller	May 3, 1910	Contract No. 36, Erie canal — Operating winches for movable dams in Mohawk river	72,000 00	44,800 00	0
Scott Brothers	Dec. 13, 1909	Contract No. 54, Champlain canal — Lock at Fort Edward	232,908 00	250,590 10	12,310 00
Shanley-Morrissey, Inc.	Nov. 23, 1908	Contract No. 68, Champlain canal — Locks at Mechanicville, Stillwater and Northumberland	1,175,623 00	1,027,135 60	661,630 00
I. A. Hodge & Co., Inc.	Dec. 11, 1909	Contract No. 69, Champlain canal — Lock at lower Mechanicville	270,675 00	240,061 00	64,190 00
Shanley-Morrissey, Inc.	Jan. 11, 1910	Contract No. 70, Champlain canal — Hudson river, Waterford to Lock No. 1	749,300 00	779,636 50	136,470 00
Shanley-Morrissey, Inc.	Jan. 11, 1910	Contract No. 71, Champlain canal — Hudson river, Lock No. 1 to lower Mechanicville	1,502,100 00	1,561,119 00	132,840 00
Shanley-Morrissey, Inc.	Dec. 14, 1909	Contract No. 72, Champlain canal — Hudson river, lower Mechanicville to Stillwater	1,439,733 00	1,202,658 00	127,380 00
E. M. Graves	May 26, 1910	Contract No. 73, Champlain canal — Hudson river, Stillwater to Northumberland	778,960 00	767,467 00	6,000 00
D'Olier Engineering Co.	April 12, 1910	Contract No. 90, Champlain canal — Power-supply and operating equipment at Smiths Basin, Comstock and Whitehall locks	94,093 65	91,857 65	800 00

REPORT

OF THE

DIVISION ENGINEER

OF THE

MIDDLE DIVISION

For the Fiscal Year Ended September 30, 1910

MIDDLE DIVISION.

STATE OF NEW YORK,
DEPARTMENT OF STATE ENGINEER AND SURVEYOR,
MIDDLE DIVISION.

SYRACUSE, N. Y., *October* 1, 1910.

HON. FRANK M. WILLIAMS, *State Engineer and Surveyor, Albany, N. Y.:*

Sir.— I have the honor to submit herewith my annual report as Division Engineer, Middle Division, for the fiscal year ended September 30, 1910.

Navigation on the Erie, Black River and Cayuga and Seneca canals has been uninterrupted throughout the season. The Oswego canal has been closed the entire season from Three Rivers to lock No. 9, at Fulton. This was authorized by an act of the last Legislature and was for the purpose of progressing work on Barge canal contracts Nos. 10 and 53 — the former at Fulton and the latter at Phœnix.

On May 10, 1910, there was a break in the berme bank of the canal on the Syracuse level, just east of the N. Y. C. & H. R. R. R. crossing of the canal. The break was due to improperly backfilling a sewer trench which passed under the canal prism at that point. It was repaired in time for the opening of navigation May 15.

SPECIAL LEGISLATION.

CONSTRUCTING A LIFT BRIDGE OVER THE ERIE CANAL AT SENECA STREET, UTICA.

(Chapter 454, Laws of 1909.)

Contractor, N. D. Peters Co.

Engineer in charge, L. D. Brownell.

Engineer's estimate	$19,000 00
Contractor's bid	15,992 75
Work done to date	15,318 00

Work is not quite completed.

CONSTRUCTING A LIFT BRIDGE OVER THE ERIE CANAL AT FRANKLIN STREET, SYRACUSE.

(Chapter 453, Laws of 1909; Chapter 527, Laws of 1910.)

Preliminary survey, maps, plans and specifications completed.

CONSTRUCTING A NEW IRON BRIDGE OVER THE ERIE CANAL AT SOUTH WASHINGTON STREET IN THE CITY OF ROME.

(Chapter 522, Laws of 1910.)

Preliminary survey and maps completed. Plans under way.

CONSTRUCTING STAIRWAY FOR A LIFT BRIDGE AT CATHERINE STREET, SYRACUSE.

(Chapter 683, Laws of 1906.)

Contractor, John M. Shultz.

This structure was let for a lump sum of $1,500 for the work complete. It was started in 1908 and has been completed this year.

IMPROVEMENT OF THE WEIGH LOCK BUILDING IN SYRACUSE.

(Chapter 524, Laws of 1910.)

Under this act the sum of $15,000 was appropriated for providing fire-proof vaults for State records and improving the building in such manner as to render it as fire-proof as possible without rebuilding it. Plans and specifications for the work have been completed.

IMPROVEMENT OF THE CAYUGA AND SENECA CANAL.

(Chapter 433, Laws of 1909; Chapter 391, Laws of 1909.)

The work on preliminary surveys, maps and plans has continued throughout the year under the direct charge of Deputy State Engineer, Harry W. DeGraff. Only the financial part of the work has been cared for by the Division office.

COURT OF CLAIMS SURVEYS.

In addition to the usual requirements of the Superintendent of Public Works, in connection with ordinary repairs, considerable work has been done in making surveys and maps of private properties alleged to have been damaged by the State, and putting the data in proper form for the Court of Claims.

BARGE CANAL.

That portion of the Barge canal known as the Middle Division extends from the east line of Oneida county to the south line of Wayne county, a distance, including Oneida and Cross lakes, of about 107.4 miles. It also includes the Oswego branch, extending from Three Rivers to Oswego, a distance of about 23 miles, the Cayuga and Seneca branch, extending from Montezuma aqueduct to the foot of Seneca lake at Geneva, a distance of about 22 miles, and the territory covered by the Delta and Hinckley reservoirs in Oneida and Herkimer counties.

The main line, or Erie Barge canal, is divided into three sections, viz., 5, 6 and 7. Section No. 5 was in charge of Resident Engineer Edwin Styring, with headquarters at Rome, until September 9, 1910, when contract No. 42, comprising the easterly end of the section, was made a part of another residency and placed in charge of Mr. S. M. Savage, as Resident Engineer, with headquarters at Utica. Sections Nos. 6 and 7 were in charge of First Resident Engineer Fred J. Wagner until June 1, 1910, when he resigned and Mr. D. C. Wedgeworth was placed in charge as Resident Engineer, with headquarters at Syracuse.

The Oswego Barge canal is in charge of Resident Engineer T. M. Ripley, with headquarters at Fulton. The Delta and Hinckley reservoirs are in charge of Resident Engineer L. C. Hulburd, with headquarters at Rome. The Cayuga and Seneca Barge canal is in charge of Resident Engineer James Burden, with headquarters at Albany.

ERIE CANAL, RESIDENCY NO. 5.

Resident Engineer Edwin Styring reports:

"Residency No. 5 of the Erie canal (until September 9, 1910) extended from the Herkimer-Oneida county line on the east to the Oneida-Onondaga county line in Oneida lake on the west, having a length of 38 miles, 7½ of which are in Oneida lake.

"On September 9, contract No. 42 was taken from the residency and embodied in a residency known as No. 4-A, embracing contracts Nos. 29 and 42. Residency No. 5 now consists of contracts Nos. 43, 44 and 4, having a total length of 32.2 miles.

"*Contract No.* 42. This contract extends from the Herkimer-Oneida county line to the Oriskany road crossing the valley from

Oriskany, a distance of 8.96 miles. The main features of the contract are lock No. 20, five bridges and a few small structures. The contract in the main is a heavy excavation contract. The contract was let to Shanley-Morrissey, Incorporated, on July 9, 1909, for $1,163,625; Engineer's estimate, $1,312,814. Recently two alterations have been affixed to the contract, increasing it by $37,423.50 — alteration No. 1, moving back the spoil banks from the edge of the prism cut and changing embankment specifications and piling culverts, and alteration No. 2, driving sheet-piling in soft material at east end of contract.

" Nearly the whole length of the contract has been worked over by the excavating machines, but no stretch of it is completed. The large units of plant employed are: Two Lidgerwood excavators, 2.3-yard drag buckets; one Heyworth excavator, 3.3-yard bucket; one large and one small tower excavator, comprising a hoister, drag bucket, cable and tower; two small Thew steam-shovels; one 12-inch suction dredge; one 25-ton locomotive; several hoisters; three New Era graders, and numerous smaller articles of plant.

" Beginning at the east end of the contract, the first 1,300 feet are untouched, but from this point westerly to about Park avenue, two miles from the beginning, the two Lidgerwood excavators have nearly completed the prism cut, although little of the slopes have been touched, and the embankments along the sides, which were made by the Lidgerwood machines, have been but partially trimmed and graded. A large amount of material excavated is misplaced and will have to be moved to make embankments at other places.

" Between Park avenue and Genesee street, Deerfield, a distance of about 1,900 feet, the two small Thew shovels have made but a small portion of the heavy cut.

" Between Genesee street and Schuyler road, 1.5 miles, the two Lidgerwood excavators have left the prism excavation in a partial state of completion, the prism cut having been roughly taken out and the larger part of the excavation made. The slopes of the prism have not been dressed and a large part of the material excavated will have to be moved farther back from the edge of the canal.

" Near Schuyler road a few thousand yards of embankment have been completed.

"Between Schuyler road and the approach to lock No. 20, a distance of 2.3 miles, a Heyworth excavating machine, with a 3.3-yard bucket, has taken out a prism cut equal to about half of the prism area. It is completing the cut on its way back to Schuyler street. Some of the material this machine has removed will need rehandling, as the machine was unable to place all of it in the proper position. At the site of lock No. 20 and its approaches, excavating has been going on since last fall, the machines employed being a tower excavator, a small Thew shovel, three New Era graders, besides a number of teams and slip scrapers. A large amount of excavation in this area has been done, but a large part remains, especially at the lock proper, where the tower excavator has been at work.

"From the upper approach to lock No. 20 to the end of the contract, about two miles, the prism excavation is at places nearly completed and at other places a large portion of it is completed. This portion of the work has been done almost entirely by the three graders, teams and slip scrapers. A small amount of excavation at the west end of the contract was removed by the tower excavator. 500 feet of embankment at the west end of the contract is completed. The work of the suction dredge for the year was that of digging the new channel for the river at the west end of the contract.

"The only structures on the contract that have been touched are the Whitesboro-Marcy road and the Cary's Crossing road bridges. On the former the concrete abutments are completed and on the latter the foundations are ready for laying the abutments.

"The following table will show the percentage of work done on each item of the contract, percentage of work done during year and the whole amount of work done to date:

ITEMS OF WORK.		Preliminary estimate, including alterations.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing	acres	28	6.8	14.5	24.2	51.8
Grubbing	cu. yds.	37,120	17,384	24,313	46.8	65.5
Excavation	cu. yds.	2,810,000	1,009,066	1,068,486	35.9	38
Embankment	cu. yds.	643,100	106,741	148,391	16.6	23.1
Foundation piles	lin. ft.	113,700	2,299	2,299	2	2
Wooden sheet-piling	ft. B. M.	774	23.4	23.4	3	3
Second-class concrete	cu. yds.	34,590	167.4	167.4	0.4	0.4
Reinforced concrete	cu. yds.	2,160	80	80	3.7	3.7

No items worked on, other than above.
Total of all work done during year = 17.6 per cent of estimated cost.
Total of all work done to date = 19.1 per cent of estimated cost.

"*Contract No.* 43. This contract extends from the Oriskany road opposite Oriskany at the end of contract No. 42, west to 1,500 feet west of Mud creek, the beginning of contract No. 44, a length of 10.32 miles. The contract was let to the M. A. Talbot Company on October 15, 1909, for $1,320,560; Engineer's estimate, $1,529,885.

"Construction has not as yet commenced on this contract, but since the first of September part of the plant has been brought on the ground, much more of it ordered and part of it on the way. A storage and concrete plant and gravel washing plant are being erected. Excavators will soon commence excavation at the Mill street bridge abutments. It is probable that several of the concrete structures in the vicinity of Rome will be built during the fall and winter and the excavating plant shipped, erected and made ready for work in the early spring.

"The long delay, nearly a year, in commencing the work, was due to uncertainty as to the crossings of the New York Central and the New York, Ontario & Western railroads and the Utica & Mohawk Valley electric railway — propositions that vitally affected the contract. The Barge canal crosses the New York Central railroad both east and west of Rome, the two crossings being about four miles apart. The Utica and Mohawk Valley electric railway is crossed by the canal in the vicinity of Mill street and New York, Ontario & Western railroad, Clinton branch, with five of its spurs, is crossed between the present Erie canal and Lawrence street, Rome.

"As the character of plant the contractors would use depended materially upon the amount and character of work they would do for the railroad changes in conjunction with the canal work, they made no attempt to commence operations until the railroad proposition was disposed of. The railroad changes were finally agreed upon by the State, the several railroad companies, the city of Rome and the Public Service Commission, and the contractor was enabled to plan his work. The M. A. Talbot Company was given the contract for making the railroad changes by the New York Central Co. and it will, in conjunction with its State contract, do all the new railroad work, excepting the new depot and surfacing. Under the final plans, contract No. 43 stands as it was let, with the exception of the plans for bridging Mill, Lawrence and James streets, the junction locks at the Erie canal crossing and minor changes in the sides of the canal at the railroad connections. The New York Central railroad will be changed for about four miles of its length through Rome. Commencing at a point about 2.3 miles east of James street, where the Barge canal begins to touch the present road, the railroad is turned to the south and the crossing avoided. It follows a tangent across the flats south of Rome and enters the present road west of Rome, about one-half mile west of the "Muck road." The new location is at all points near enough to the Barge canal to permit using the excavation for building the railroad embankments. At the east and west ends of the relocated road, connections are made with the present road by bridges over the canal, and the present road through Rome will be used for industrial purposes. The New York, Ontario & Western railroad will pass by subway under the relocated Central, and by single track bridge over the Barge canal to its present ending at James street. Its passenger trains will enter the Central depot near Mill street. The Utica & Mohawk Valley electric railway will be turned in its course near Mill street and pass under the New York Central by subway, thence over the Barge canal up Mill street to Dominick street. It is the plan of the New York Central to build a new depot just west of Mill street, which will take the place of the old structure at James street and will be used by the New York Central, Ontario & Western and trolley roads.

"*Contract No.* 44. This contract extends from contract No. 43, 1,500 feet west of Mud creek, to the east end of contract No. 4, a distance of 7.08 miles. This is a heavy excavation contract and in addition it has the two big locks, Nos. 21 and 22, each of 25-foot lift. The contract was let to Scott Bros. on January 8, 1910, for $1,748,679; Engineer's estimate, $1,926,093.

"During the winter and spring the contractors were busy moving their plant across country from Greenway, on the New York Central, to their camp site near Stony brook road. Work was commenced early in March at Stony brook road by two No. 60 Marion steam-shovels and one No. 70 Bucyrus steam-shovel. Later on, one of the shovels was moved east to the beginning of the contract and worked west toward the other two shovels. The combined work of these shovels up to September 30 was 435,000 cubic yards of prism excavation, the east shovel taking out 91,000 yards, between Stas. 6322 and 6349, and the two shovels, 344,000 yards, between Stas. 6386 and 6434. The east shovel has found excavation very easy, but the two other shovels, with the exception of a few feet in thickness of easy digging at the surface, have been excavating very hard material in hard pan, some of which had to be blasted, the material getting harder as the cut lowered.

"Outside of the work of the shovels, the building of the abutments of the Stony brook road bridge is all the work done on the contract east of New London. At New London one of the abutments of the road bridge is completed and the other is under way. Continuing west from New London, at Sta. 6532, an excavator, consisting of a tower, hoister, cables and drag bucket, commenced operations on August 25 and on September 30 had removed 10,000 yards of prism excavation. This machine will work west toward lock No. 21, where work has commenced on the upper lock approach.

"On July 23, a 45-ton Marion shovel commenced excavation on the upper south approach wall of lock No. 21, removing at the same time part of the prism excavation. Excavation for the approach wall is completed and foundation piles driven. A concrete mixer and tower for elevating and conveying the concrete to the forms by chutes is erected and construction of the approach wall will begin early in October.

"After completing the excavation for the approach wall, the shovel was sent to the west wall of lock No. 21, making a cut to elevation where the steel sheet-piling commences. The driving of this piling has just commenced. Laying the south approach wall of lock No. 21, shovel excavation at the lock, driving of sheet-piling and excavating within it with an orange-peel dredge, will be carried on during the winter and fall. The shovels on the east end of the contract will continue work all winter and the tower excavator as long as the weather permits.

"A tipple incline and steam-shovel excavating unit, the same as was in use on contract No. 6, on the Western Division, is being placed at Sta. 6440, just west of Stony brook. It will commence excavation early in October and work westward toward New London.

" Since the beginning of the work last spring, a large force, at times over 400 men, has been employed, most of it on two shifts. A large amount of work not shown by the estimates has been done. The delivery of plant and material from Greenway, on the New York Central, across country to camp No. 1 and from the Erie canal at Grove Springs road to camp No. 2, has occupied much of the contractor's time, at much expense of labor and material. A receiving depot has been erected on the Erie canal at Grove Springs road and on the canal opposite camp No. 1. Camp No. 1 is located at the junction of Stony brook road and the canal line and camp No. 2 at lock No. 21.

" The following table shows the percentage of work done on each item of the contract and the percentage of work done during the year and to date:

ITEMS OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing........................... acres	100	3.1	3.1	3	3
Excavation........................ cu. yds.	3,243,400	469,706	469,706	14.5	14.5
Sheeting and bracing.............. ft. B. M.	300,000	8,378	8,378	2.8	2.8
First-quality steel piling............. sq. ft.	30,000	1,179	1,179	3.9	3.9
Foundation piles, 12 lto 30 ft. long..... lin. ft.	204,800	10,400	10,400	5.7	5.7
Second-class concrete.............. cu. yds.	89,860	528	528	0.6	0.6
Reinforced concrete................ cu. yds.	550	161	161	29.3	29.3
Metal reinforcement................. lbs.	113,000	17,213	17,213	15.2	15.2
Coffer-dams, pumping, etc....... lump sum	$21,000	$2,940	$2,940	14	14

Total of all work done during year = 6.3 per cent of estimated cost.
Total of all work done to date = 6.3 per cent of estimated cost.
Contract price = $1,748,679.
Cost of work to date = $109,760.

" *Contract No.* 4. This contract was one of the first to be let on the Barge canal. Contracted originally April 18, 1905, to Lindon W. Bates, it was assigned to the Empire Engineering Corporation on May 21, 1905. The end of the fiscal year 1909 found the contract nearly completed and the contractors made efforts to complete it before the ensuing winter set in, but were caught by severe weather and had to suspend operations until spring. Resuming operations in the spring, the work on the contract proper was completed early in June, but several extra work orders and clearing up kept a small force on the contract until September. The work done this year is about 4 per cent of the contract and consists mostly of dredge work, cleaning up the prism cut. Other work was small items of grading slopes of prism, placing riprap at structures, lining bridge approaches and fencing. The following table will show the percentage of work done on each item during the year:

ITEMS OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing .... lump sum	$1,000	0	$900	0	90
Grubbing .... cu. yds.	2,800	0	2,421	0	86.5
All excavation .... cu. yds.	2,977,521	241,044	2,767,255	8	92.9
Forming embankment .... cu. yds.	154,905	10,846	84,863	7.3	54.8
Lining .... cu. yds.	1,700	424	1,233	25	72.5
Yellow pine .... ft. B. M.	300 000	874	280,874	0.3	93.6
White oak .... ft. B. M.	10,000	0	7,034	0	70
Round timber .... lin. ft.	565,000	0	533,783	0	94
Square sawed hemlock .... ft. B. M.	412,000	0	473,460	0	112.5
Foundation piles, 12 ft. long .... No.	1,908	0	1,966	0	103
Foundation piles, 20 ft. long .... No.	256	0	174	0	68
Foundation piles, 35 ft. long .... No.	88	0	86	0	98
Mooring piles, 30 ft. long .... No.	14	0	6	0	43
Docking piles, 30 ft. long .... No.	283	0	283	0	100
Sheet-piling .... ft. B. M.	378,352	0	388,054	0	107.5
Steel and iron fastenings .... lbs.	90,000	8,204	75,609	9.5	84
Second-class concrete .... cu. yds.	10,058	1,055	9,623	10.1	95.
First-class masonry coping .... cu. yds.	9.14	0	5	0	55
Stone paving .... sq. yds.	2,300	253	1,273	10.5	55
Stone filling .... cu. yds.	48,000	66	50,234	0.1	104.6
Second-class riprap .... cu. yds.	2,962	1,332	2,964	45	100
Fencing .... lin. ft.	2,150	2,095	2,095	97.4	97.4
Maintaining traffic, Sylvan Beach bridge lump sum	$6,000	0	$6,000	0	100
First-class concrete .... cu. yds.	1,250	0	1,278	0	102.5
Foundation piles, 25 ft. long .... No.	132	0	132	0	100
Steel reinforcement .... lbs.	139,100	0	137,125	0	99
Drain pipe .... lbs.	800	0	800	0	100
Paved gutter .... sq. yds.	104	0	103	0	99
Extra labor and forms .... lump sum	$2,376	0	$2,376	0	100
Removing revetment .... lin. ft.	6,965	0	7,250	0	104
Removing piles, 25 ft. and 30 ft .... No.	42	3	42	7	100
Removing concrete .... cu. yds.	280	0	264	0	94
Tie rods .... No.	200	0	33	0	16.5
Overhaul on extra excavation .... cu. yds.	611,043	0	611,043	0	100
Reinforced concrete .... cu. yds.	89	0	89	0	100

Total of all work done during year = 4 per cent of estimated cost.
Total of all work done to date = 96 per cent of estimated cost.

" *General Residency Work.* The office force has varied from time to time, but consists now of the Resident Engineer, one chainman as clerk, one draftsman, one axeman and one laborer.

" The preliminary work of the office for the past year has been the making of the very large number of appropriation maps of contracts Nos. 43 and 44. These have all been completed and forwarded and many of the appropriations made.

" The ordinary work of the office from month to month has been the taking care of the contract work that comes to the office from the contracts within the residency, such as checking estimates and notes, reports, map work, blue printing, tabulating notes and work on final estimates.

"An Assistant Engineer's office was established at New London on June 1, 1910, to take charge of contract No. 44.

" On September 9, the Assistant Engineer's office at Whitesboro in charge of contract No. 42, was formally turned over to Mr. S. M. Savage, newly appointed as Resident Engineer for Residency No. 4-A. All residency matter — notes, books, etc.— was transferred to Mr. Savage."

ERIE CANAL, RESIDENCIES NOS. 6 AND 7.

Resident Engineer D. C. Wedgeworth reports:

" *Residency No.* 6.

" Residency No. 6 extends from deep water in Oneida lake to Baldwinsville, a distance by canal line of 23.4 miles. Contracts Nos. 45 and 57 and a portion of Nos. 12, 13, 22 and 90 are within the limits of this residency.

" *Contract No.* 12. This contract was let to the Stewart-Kerbaugh-Shanley Co. of New York city, on September 23, 1907. An assignment to James Stewart & Co. was approved by the Superintendent of Public Works on August 25, 1910.

" The total length of this contract is 43.73 miles, extending from deep water in Oneida lake to Mosquito Point bridge over the Seneca river. Of this distance 22.5 miles are in Residency No. 6 and the remainder in Residency No. 7.

" The work done on this contract has been that of excavation entirely. Two ladder-dredges have worked from deep water to highway bridge in Brewerton and at what is known as the Brewerton cut from Sta. 2870 westerly. These dredges discontinued work, at Brewerton on the 4th of June and at Brewerton cut on the 25th of July. One hydraulic dredge has been at work in river sections and in cutting across 'Big Bend,' from Sta. 3185 westerly. It is expected that this cut will be completed this fall.

"A Page excavator has been at work throwing up levees for spoil areas where work has been done by hydraulic dredge.

"At 'Gaskins', Sta. 3357, a coffer-dam is being built for excavating this section dry.

"At the State ditch, Residency No. 7, a dipper-dredge and drill-boat have completed the cut to Cross lake and worked down-stream, taking out the hard material to Sta. 4197. A part of this excavation has been passed over, to be taken out later with hydraulic dredge. Dipper-dredges are to be built during the winter months for this contract and it is expected that work will be carried on more rapidly next season.

"The following table will show the amount of work done during the year:

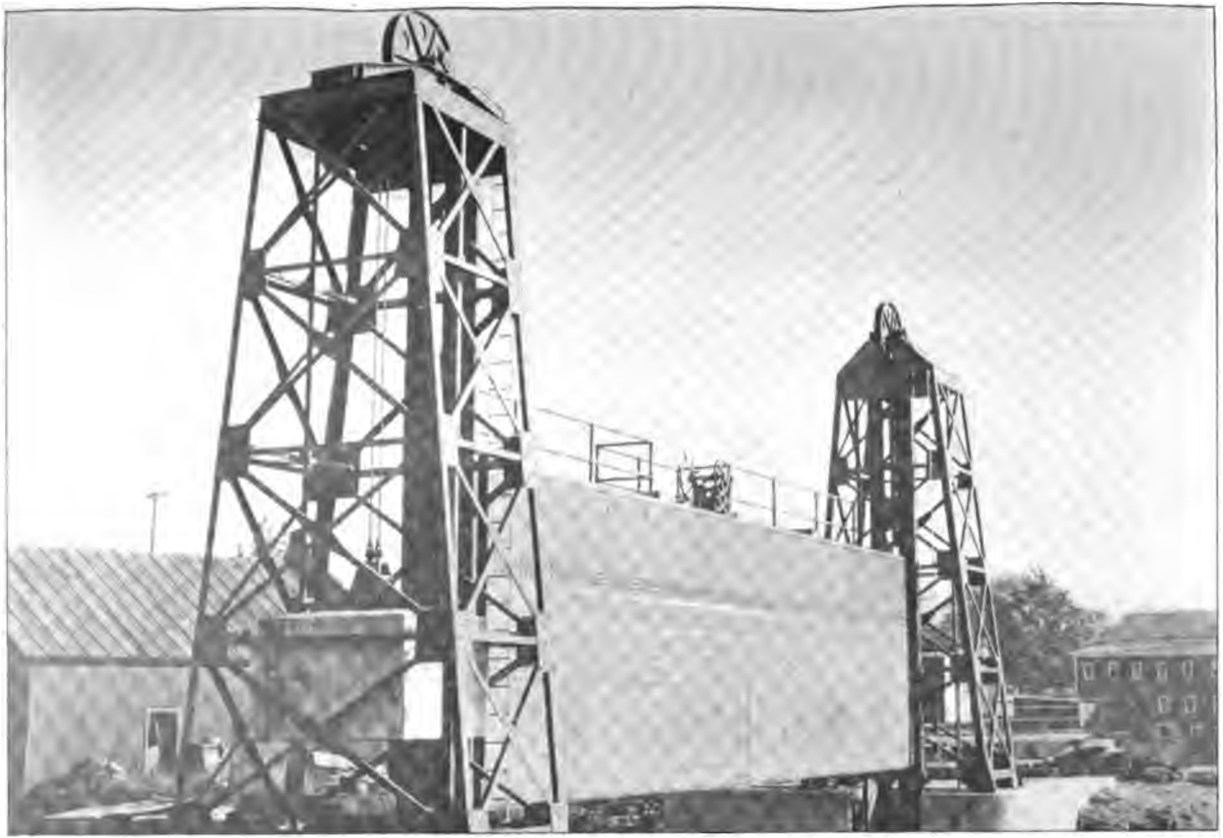
ITEMS OF WORK.	Preliminary estimate as affected by alterations 1, 3 and 4.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing........................lump sum	$8,800	$70 40	$3,423 20	0.8	38.9
Grubbing........................cu. yds.	12,200	0	8,036	0	66
Excavation......................cu. yds.	7,692,170	865,837	2,909,425	11	31
Sheeting and bracing.............ft. B. M.	52,000	0	27,590	0	53
Forming embankment...............cu. yds.	127,150	7,362	25,902	6	20
Lining..........................cu. yds.	1,330	0	490	0	37
Sawed lumber, yellow pine or Douglas fir ....ft. B. M.	689,900	....	36,500	0	5
Foundation piles, 12 ft. long...........No.	·175	0	33	0	19
Foundaton piles, 20 ft. long............No.	180	0	71	0	39
*Foundation piles, 25 ft. long..........No.	....	0	16	....	....
*Foundation piles, 30 ft. long..........No.	....	0	1	....	....
Second-class concrete.............cu. yds.	28,880	0	1,045	0	4
†Reinforced concrete..............cu. yds.	510	56	849	11	167
First-class masonry bridge coping...cu. yds.	10	1.64	7.1	16	71
Wash wall.......................cu. yds.	10,270	37.8	49.8	0.36	0.48
Cobblestone paving...............sq. yds.	120	0	30	0	25
Third-class riprap................cu. yds.	230	7	110	3	48
Structural steel.......................lbs.	665,200	0	556,114	0	83
Metal reinforcement...................lbs.	78,200	7,060	56,419	9	72
Raising bridge superstructure.....lump sum	$1,100	0	$1,100	0	100
Maintaining highway traffic......lump sum	$6,600	6	$3,102	6	47
Deductions.					
Sheeting and bracing reused.......ft. B. M.	20,000	0	....	....	100
Bridge superstructures removed...lump sum	$1,350	0	....	....	100
Gross estimate............................	$3,514,819	$365,680	$1,230,150	10	35

* Found necessary to use longer piles than called for in preliminary estimate.
† Changed from second-class to reinforced concrete by order of State Engineer.

"*Contract No. 45.* This contract is for the construction of a dam at Caughdenoy and of lock No. 24 and appertaining structures at Baldwinsville, and is 0.55 mile in length. Contract was let to Scott Bros. May 6, 1908.

"Aside from abutments of guard-gate, work on this contract for the year has been mainly the erection of steel. Lock-gates and valves have been placed and guard-gates and automatic dam erected.

"The contractor has removed his plant and the work has been cleaned up and completed with the same thoroughness and energy which has marked the entire progress of the work.



Barge Canal, Contract No. 45.

Guard-gate at head of old canal channel, Baldwinsville.

"The following table will show the amount of work done during the year:

ITEMS OF WORK.	Preliminary estimate, as affected by alterations 1, 2 and 3.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing .... acres.	5	5	5	100	100
Grubbing .... cu. yds.	570	0	512	0	90
Excavation .... cu. yds.	335,002	36,837	257,861	11	77
Sheeting and bracing .... ft. B. M.	120,000	1,066	12,306	0.9	10
Forming embankment .... cu. yds.	55,698	8,313	34,021	15	61
Lining .... cu. yds.	1,150	854	932	74	81
Sawed lumber, yellow pine .... ft. B. M.	40,700	28,529	39,329	70	97
Sawed lumber in needles .... ft. B. M.	12,000	13,001	13,001	108	108
Sawed lumber, hemlock .... ft. B. M.	27,860	24,391	24,391	88	88
White oak lumber .... ft. B. M.	8,170	7,151	7,151	88	88
Round timber in cribs .... lin. ft.	320	0	0	0	0
Stone filling in cribs .... cu. yds.	330	267	267	81	81
Foundation piles .... lin. ft.	3,700	0	1,272	0	34
Wooden sheet-piling .... ft. B. M.	56,200	0	14,730	0	26
First-class concrete .... cu. yds.	9.9	0	3.5	0	35
Second-class concrete .... cu. yds.	31,626.1	1,530	30,484	5	96
Reinforced concrete .... cu. yds.	313	76.38	293	24	94
Bridge coping .... cu. yds	5	0	5	0	100
Wash wall .... cu. yds.	630	155	617	25	98
Third-class riprap .... cu. yds.	1,430	66	1,347	5	94
Fourth-class riprap .... cu. yds.	125	0	114	0	91
3½-in. cast iron pipe and specials .... lbs.	3,150	0	1,751	0	55
2½-in. cast iron pipe and specials .... lbs.	300	20.5	258	7	86
15-in. vitrified pipe, laid .... lin. ft.	231	207	223	90	97
8-in. vitrified pipe, laid .... lin. ft.	200	184	184	92	92
Structural steel .... lbs.	285,585	12,529	279,619	4	98
Metal reinforcement .... lbs.	35,100	17,806	20,779	51	59
Steel castings .... lbs.	13,780	5,020	12,820	36	93
Iron castings, plain .... lbs.	3,511	2,936	2,936	84	84
Iron castings, machined .... lbs.	7,000	1,388	6,713	20	96
Portland cement sidewalk .... sq. ft.	3,140	3,127	3,127	99	99
Stone curbs .... lin. ft.	794	672	672	85	85
Cobblestone paving .... sq. yds.	300	289	289	96	96
Brick pavement .... sq. yds.	820	792	792	97	97
Wood pavement .... sq. yds.	330	330	330	100	100
Wrought iron chain .... lbs.	850	795	795	94	94
Wrought iron pipe railing .... lin. ft.	1,861	872	1,719	47	92
Lattice railing .... lin. ft.	180	0	180	0	100
Fender fastenings .... No.	580	102	514	18	89
Metal in lock-gates .... lbs.	195,000	177,153	188,508	91	97
Metal in buffer-beams .... lbs.	90,000	75,750	81,192	84	90
Metal in lock-valves .... lbs.	24,000	21,160	23,208	88	97
Metal in guard-gate .... lbs.	83,000	82,057	82,057	99	99
Metal in automatic dam .... lbs.	80,000	78,672	78,672	98	98
Coffer-dams, pumping, bailing and draining .... lump sum	$36,600	$13,780	$36,600	38	100
Removing bridge superstructure .... lump sum	$200	0	$200	0	100
Maintaining highway traffic .... lump sum	$500	0	$500	0	100
Removing coffer-dam above automatic dam .... lump sum	$730	$730	$730	100	100
Supporting trees, Water street .... lump sum	$50	$50	$50	100	100
Drilling holes in I-beams and channels and placing steel plates on automatic dam .. lump sum	$330	$330	$330	100	100
Grading cemetery adjacent to upper approach wall to lock .... lump sum	$175	$175	$175	100	100
Chipping concrete, and drilling holes in same .... lump sum	$29.19	$29.19	$29.19	100	100
Credit for buildings in place .... lump sum	$200	$200	$200	100	100
Deduct buildings sold to contractor .... lump sum	$9,000	....	$9,000	....	....
Gross estimate	$472,802 35	$76,781 93	$418,651 93	16	89

"*Contract No.* 13. The part of this contract on this residency is for the construction of steel highway superstructures at Stas. 2901+83, 2960 and 3185+48.

"This contract was let to The Penn Bridge Co. on Nov. 7, 1908.

"The steel for bridges at Stas. 2960 and 3185+48 is in place and riveted.

"The following table will show amount of work done during the year:

ITEMS OF WORK.	Preliminary estimate.	Work done during year	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Structural steel.........................lbs.	300,000	195,330	195,330	65	65
Setting coping stones................cu. yds.	6	2.46	2.46	41	41
Gross estimate..........................	$17,995.30	$7,330	$7,330	40.8	40.8

"*Contract No.* 57. This contract is for the construction of a harbor at the south end of Onondaga lake. Plans for this work are now in Albany and are being held for further consideration.

"*Contract No.* 90. The part of this contract on this residency is for furnishing and installing equipment for operating and lighting lock No. 24, Erie canal, at Baldwinsville. This contract was let to the D'Olier Engineering Co. on April 6, 1910.

"Foundations for power house have been laid and the work of laying lighting ducts is progressing. The work has progressed as rapidly as the assembling of material would allow. The following table will show work done during the year:

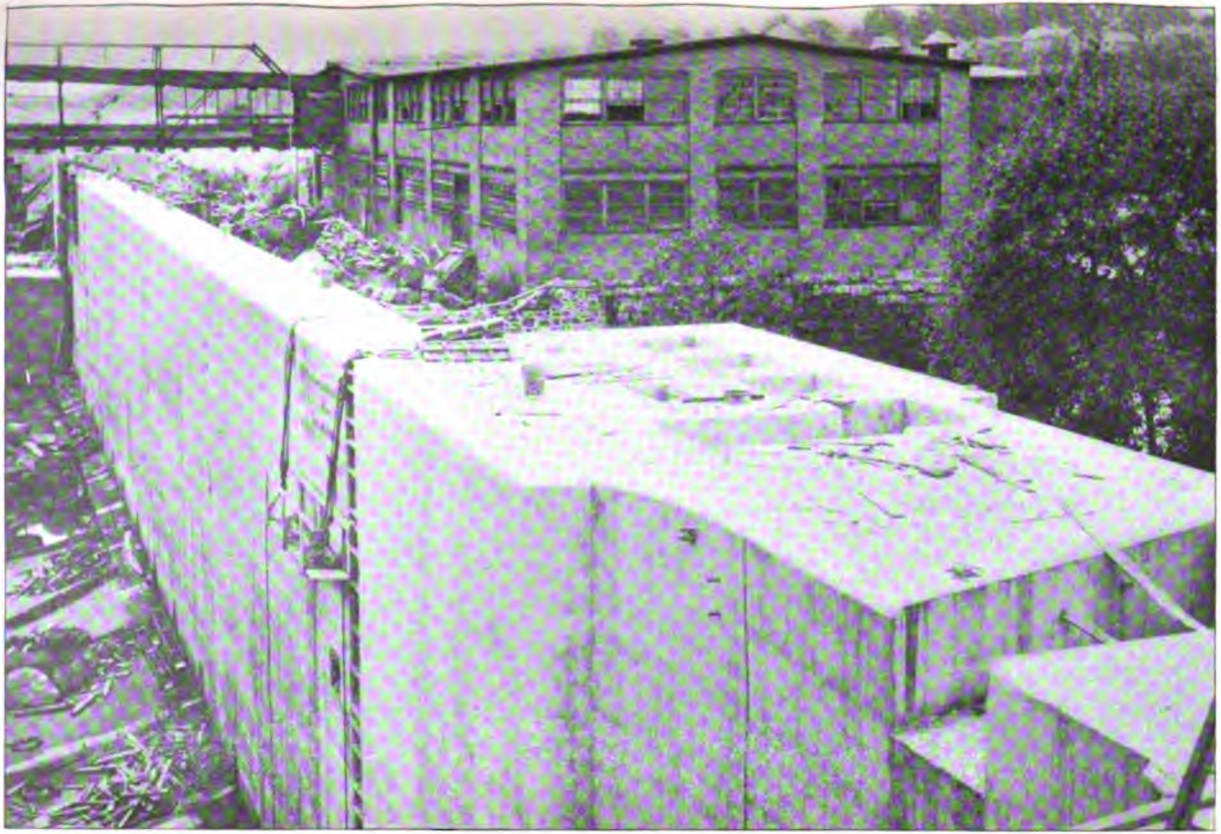
ITEMS OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Excavation.........................cu. yds.	200	94	94	47	47
Chipping concrete.......................cu. ft.	310	1	1	0.3	0.3
Embankment......................cu. yds.	200	54	54	27	27
Second-class concrete.................cu. yds.	44	15	15	34	34
Metal reinforcement.....................lbs.	24,000	746	746	3	3
Concrete conduit, single duct..........lin. ft.	10,200	475	475	4	4
Gross estimate..........................	$178,197	$430	$430	0.3	0.3

"*Contract No.* 22. This contract is for constructing new highway bridges over the Erie canal within the limits of contract No. 12.

"This work has recently been awarded to M. Fitzgerald.

"*Residency No.* 7.

"Residency No. 7 extends from Baldwinsville to the Wayne county line, a distance of 32.7 miles by Barge canal line. The contracts in this residency are No. 46 and a portion of Nos. 12 and 22, which have been described under Residency No. 6.



BARGE CANAL, CONTRACT NO. 10.
View of east wall of lock No. 2, Oswego canal, at Fulton.

"*Contract No.* 46. This contract was let to the Kinser Construction Co. of Chicago, November 23, 1908. This contract covers the construction of the Barge canal from Fox Ridge to the southeast corner of the town of Galen, a distance of 9.44 miles.

"The work up to October has been mainly hydraulic dredging. The prism has been completed from Wayne county line to the Montezuma aqueduct. Piles have been driven for the Wayne county line bridge and sheet-piling at Seneca river stream entrance. Excavation for the movable dam at May's Point has commenced and part of the piles driven. It is expected that this work will be completed before winter sets in.

"The following table will show the amount of work done on this contract to date:

ITEMS OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing .... lump sum	$5,000	0	$2,350	0	47
Excavation .... cu. yds.	5,035,000	1,163,050	2,066,450	23	41
Foundation piles .... lin. ft.	154,000	3,708	3,708	2	2
Sheet-piling .... ft. B. M.	362,000	38,792	38,792	11	11
Gross estimate	$1,212,833	$200,590	$356,510	16	29

Oswego Canal, Residency No. 1.

Resident Engineer T. M. Ripley reports:

"Residency No. 1, Oswego canal, embraces the entire Oswego river from Three River Point to Lake Ontario, a distance of 23 miles.

"The work on this residency is or will be embraced, with possible minor exceptions, under the following contracts:

"Contract No. 10. For excavating the prism, constructing locks Nos. 2 and 3, raising dams Nos. 3 and 4, building bulkheads Nos. 1, 2, 3, 4 and 5, etc., through the city of Fulton.

"Contract No. 33. For constructing lock-gates, needle-beams, guard and sluice-gates, lock-valves, etc., on contracts Nos. 10, 11, 2 and 15.

"Contract No. 35. For excavating the prism, building locks Nos. 7 and 8, two bridges, raising curved dam, etc., through the city of Oswego.

"Contract No. 37. This contract is not let. It will include the work between Fulton and Oswego.

" Contract No. 39. For excavating the prism from Three River Point to contract No. 10, at Fulton, and work incidental thereto.

" Contract No. 53. For building lock No. 1 and its approach walls at Phoenix.

" Contract No. 78. For building a dike along the Oswego river, enclosing the old tow-path, from the south end of contract No. 10, for a distance of about 1.2 miles.

" Contract No. 79. For building a bridge over the canal on Bridge street in the city of Oswego.

" Contract No. 80. For constructing a concrete dam in the Oswego river at Phoenix, N. Y. This contract is not let.

" Contract No. 90. For furnishing and installing equipment for operating and lighting locks.

" Highway contract. For raising the present public highway from the south end of the dike on contract No. 78 to high ground to the south, a distance of about 3,300 feet.

" The total amount of work done on this residency during the past fiscal year is shown in the two following tables:

Work under Contract October 1, 1909.

Contract No.	Value of work under contract.	Value of work done to Oct. 1, 1909.
10	$1,117,964 57	$357,340 00
35	707,185 85	209,410 00
53	166,735 00	1,570 00
Total	$1,991,885 42	$568,320 00

Work under Contract October 1, 1910.

Contract No.	Value of work under contract.	Value of work done to Oct. 1, 1910.
10	$1,117,964 57	$606,800 00
33	55,020 00	0
35	714,027 00	303,490 00
39	1,048,674 00	26,430 00
53	167,385 00	137,530 00
78	49,025 95	23,560 00
79	36,180 00	70 00
90	56,324 35	330 00
Highway	11,627 50	310 00
Total	$3,256,228 37	$1,098,520 00

Amount of work put under contract during the fiscal year, $1,264,342.95. Amount of work done during year $530,200.00. Amount of all contract work on the residency done to date, 33.8 per cent.
All values based on contract prices.

" *Contract No.* 10. George C. Andrews, Assistant Engineer, in charge. The McDermott Contracting Co., of Philadelphia, Pa., Contractors.

" This contract is about 1.2 miles long and the work thereon is all in the Oswego river or the present Oswego canal adjacent to the river. This has made necessary bailing and draining for the entire length of the contract. Four thousand five hundred linear feet of this contract must all be done under coffer-dams, and unless submarine work is done at the southerly end, there will have to be built about 700 feet of coffer-dam at that place.

"As stated in the report for 1909, the work has been slow, owing to difficulties encountered. During the past summer, however, good progress has been made and lock No. 2 and its upper approach walls are 95 per cent completed, with the exception of setting of the lock-gates, valves, etc.

" This work was let to Mosier & Summers, of Buffalo, in June, 1906, and was assigned to the McDermott Contracting Co., in 1909.

"At the time of the last annual report there had been but 32 per cent of this work completed. At present there is 54.5 per cent completed.

" The following table gives the summary of work done during the year and the total completed to date:

ITEMS OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing........lump sum	$100	0	100%	0	100
Grubbing........cu. yds.	3,390	0	1,284	0	37.9
Excavation........cu. yds.	466,112	58,563	313,045	12.5	67.1
Sheeting and bracing........ft. B. M.	100,000	0	80,400	0	80.4
Channeling........sq. ft.	45,300	959	12,673	2.1	28
Forming embankment........cu. yds.	86,300	4,457	21,756	5.1	25.2
Lining........cu. yds.	2,000	415	1,067	20.7	53.3
Ballast........cu. yds.	2,252	0	7	0	0.31
White oak sawed lumber for miter-sills and gates........ft. B. M.	8,000	2,046	2,046	25.5	25.5
First-class concrete........cu. yds.	4,130	1,284	1,825	31.0	44.0
Second-class concrete........cu. yds.	85,740	25,004	41,853	29.1	48.8
Wash wall........cu. yds.	3,912	1,436	2,342	36.7	59.8
Second-class riprap........cu. yds.	2,000	0	1,517	0	75.8
Vitrified pipe, 12-inch........lin. ft.	70	4	4	5.7	5.7
Second-class paving........sq. yds.	830	0	46	0	5.5
Steel castings........lbs.	13,700	4,217	6,297	30.7	45.8
Iron castings, plain........lbs.	269,900	69,859	101,761	23.5	37.6
Iron castings, machined........lbs.	78,350	27,745	36,155	35.4	46.5
Structural steel........lbs.	212,200	99,917	144,544	47.1	68
Metal reinforcement........lbs.	185,600	77,565	82,124	41.7	44
Expansion bolts........each	125	42	42	33.6	33.6
Gate hoists, heavy........each	8	5	8	62.5	100
Gate hoists, light........each	31	24	31	77.4	100
Removing buildings........lump sum	$1,530	0	$1,377	0	90
Less value of buildings........lump sum					
Concrete drain, 36-in. including manholes..lin. ft.	795	344	344	43.3	43.3
Trenching and backfilling for 30" & 36" drain, including manholes........lin. ft.	820	451	451	55	55
Sheeting and bracing, reused........ft. B. M.	0	0	2,000	....	....

Engineer's estimate (original contract), $1,126,718.
Contract price, as affected by alterations Nos. 1, 3, 7, 8, 9, 11 and 12, $1,111,964.57.
Total of all work done during year = 22.5 per cent of contract price.
Total of all work done to date = 54.5 per cent of contract price.

"*Contract No.* 33. George C. Andrews, Assistant Engineer, in charge. Penn Bridge Co. of Beaver Falls, Pa., contractors.

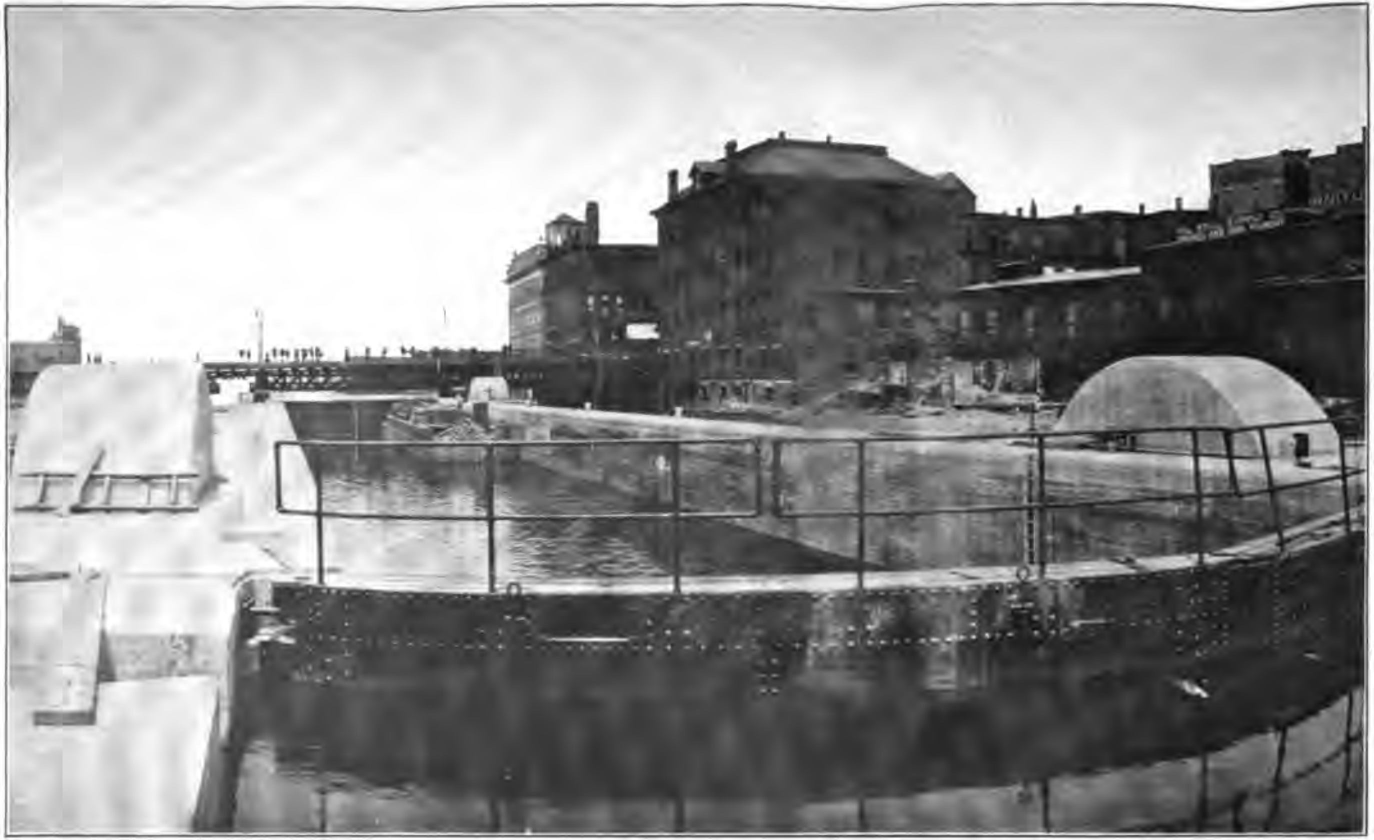
"No work has been done on this residency under this contract. Engineer's estimate for entire contract, $183,618.60. Contract price, $199,639.70.

"*Contract No.* 35. Charles R. Chase, Assistant Engineer, in charge. Gilmour-Horton-Allen Co. of Hudson Falls, N. Y., contractors.

"Work has progressed very slowly on this contract during the past year. During the winter months almost no work was done. The work was entirely shut down during January and February and from November 1 to March 31 the estimates amounted to but $15,000. Owing to the necessity of maintaining navigation, the north and south ends of this contract are flooded between May 15 and November 15, and during the past summer work has been done only at the site of lock No. 7 and a portion of its upper thrust walls. Coffer-dams were thrown around the site of lock No. 7 and navigation carried in the hydraulic canal easterly thereof. A portion of the west chamber wall of lock No. 7 has been completed during the summer and some concrete placed in the upper west approach wall.

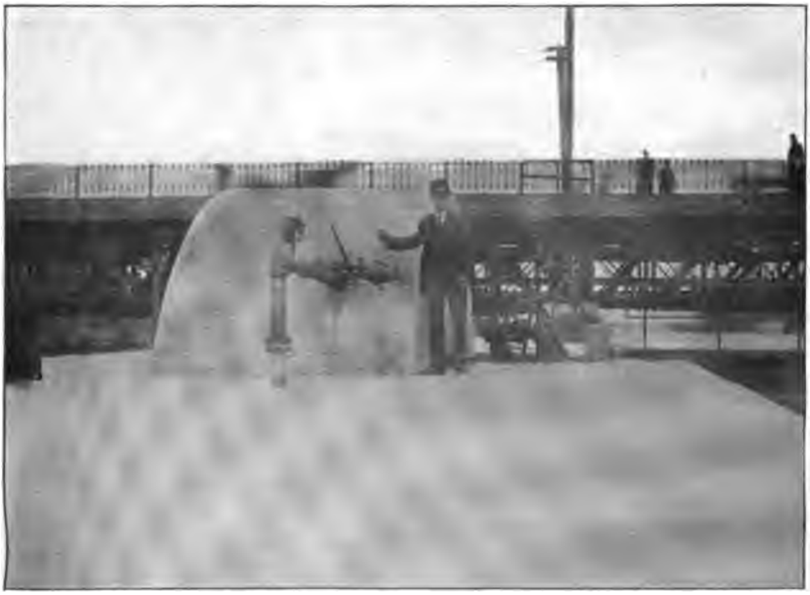
"The following table gives the summary of work done during the year and the total completed to date:

ITEMS OF WORK.		Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Excavation	cu. yds.	188,130	28,871	72,891	15.3	38.8
Embankment	cu. yds.	9,910	1,490	1,490	15	15
Puddle	cu. yds.	490	70	390	14.3	79.6
Sawed lumber, yellow pine or Douglas fir	ft. B. M.	27,200	9,541	9,541	35.1	35.1
Sawed lumber, spruce	ft. B. M.	1,500	693	693	46.2	46.2
White oak in miter-sills and gates	ft. B. M.	12,900	4,640	5,840	36.0	45.2
Sawed lumber, white oak	ft. B. M.	41,000	7,853	15,637	19.2	38.2
Second-class concrete	cu. yds.	51,685	5,513	22,787	10.6	44
Reinforced concrete	cu. yds.	1,551	35	1,168	2.3	75.4
Fourth-class riprap	cu. yds.	95	0	5	0	5.3
5" Wrought iron pipe and specials	lbs.	880	160	736	18.2	83.7
4" Wrought iron pipe and specials	lbs.	6,960	5,936	5,936	93.7	93.7
2" Pipe valves, complete	No.	2	0	2	0	100
4" Pipe valves, complete	No.	8	8	8	100	100
12" Pipe valves, complete	No.	2	0	2	0	100
20" Pipe valves, complete	No.	2	0	2	0	100
7" Vacuum gages, complete	No.	4	4	4	100	100
Structural steel	lbs.	364,400	16,108	241,610	4.5	66.3

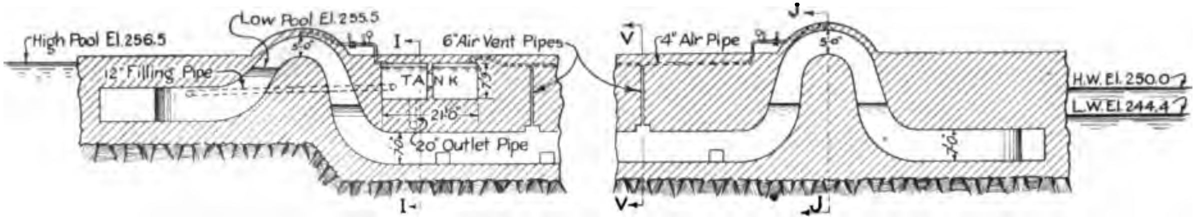


BARGE CANAL, CONTRACT NO. 35.

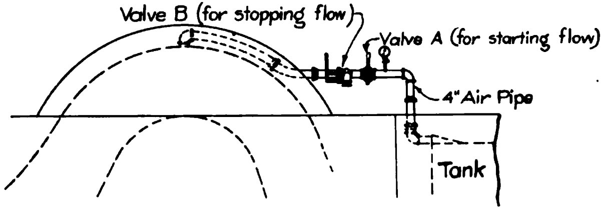
The siphon lock at Oswego. A boat of the size used on the present canal, seen near the lower gates, is being locked through.



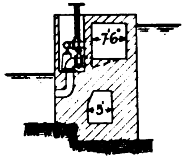
Barge Canal, Contract No. 35.
View of one of the lower siphons of the siphon lock at Oswego, showing the operating valves.



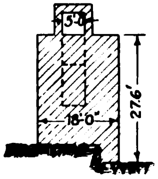
Longitudinal Section of Lock Wall



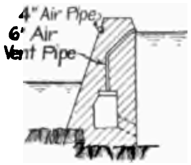
Operating Valves at Upper Siphon



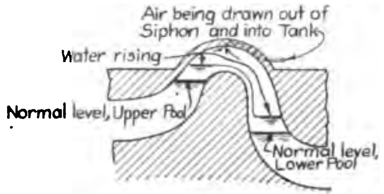
Section I-I



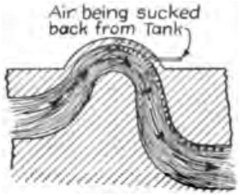
Section J-J



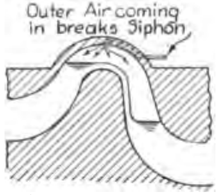
Section V-V



Starting Siphon



Siphon flowing full



Siphon being stopped

Sketches Showing Action of Siphon,

LOCK No. 8, OSWEGO N.Y.

BARGE CANAL, CONTRACT No. 35.

ITEMS OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Metal in lock-gates.........lbs.	406,000	165,901	177,261	40.8	43.6
Metal in needle-beams.........lbs.	85,000	36,899	40,681	43.4	47.8
Metal reinforcement.........lbs.	227,950	22,216	145,285	9.7	63.3
Iron castings, plain.........lbs.	51,400	4,016	15,781	7.8	30.7
Iron castings, machined.........lbs.	17,300	0	7,909	0	45.7
Wood block pavement.........sq. yds.	500	0	439	0	100
Fender fastenings.........No.	972	116	409	12.0	42.1
Expansion bolts in place.........No.	115	0	55	0	47.8
Scroll railing.........lin. ft.	440	0	396	0	87.7
Gate hoists, class "B".........No.	12	5	5	41.7	41.7
For removing old bridge superstructure..lump sum	$100	0	$75	0	75
For raising buildings.........lump sum	$900	0	$900	0	100
For maintaining highway traffic.........lump sum	$500	$50	$50	10	10
Conduit east of lock No. 8.........lump sum	$500	$400	$400	80	80

Engineer's estimate, $752,760.
Contract price, including alterations, $714,027.45.
Total of all work done during year = 13.2 per cent of contract price.
Total of all work done to date = 42.6 per cent of contract price.

"*Contract No.* 39. Edward J. Berry, Leveler, in charge. James Stewart & Co., New York city, contractors.

"This work was put under contract on the 5th day of April, 1910. It is a dredging and steam-shovel proposition, there being about 1,200,000 cu. yds. of material to move. Of this about 250,000 cu. yds. is in a cut, known as the Hinmansville cut-off, and will be done in part or entirely by steam-shovel. The remainder must be removed by dredges from the bed of the Oswego river. Excavation was started in the Hinmansville cut-off in August.

"The following table gives the summary of work done during the year and the total completed to date:

ITEM OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Excavation.........cu. yds.	1,226,000	31,844	31,844	2.6	2.6

Engineer's estimate, $972,900.
Contract price, $1,048,674.
Total done during year = 2.64 per cent of contract price.
Total done to date = 2.64 per cent of contract price.

"*Contract No.* 53. Louis A. Burns, Assistant Engineer, in charge. Scott Bros., Lynchburg, Va., contractors.

"Work has progressed steadily on this contract during the year, with the result that it is nearly completed. All of the concrete work is finished with the exception of about 120 feet of the upper right approach wall. The excavation is finished, with the exception of a small amount of cleaning up in the lock and lower approaches and a few thousand yards to be removed at the extreme upper, or south, end of the contract. Steel for the gates, needle-dams, etc., is arriving and will be placed this fall.

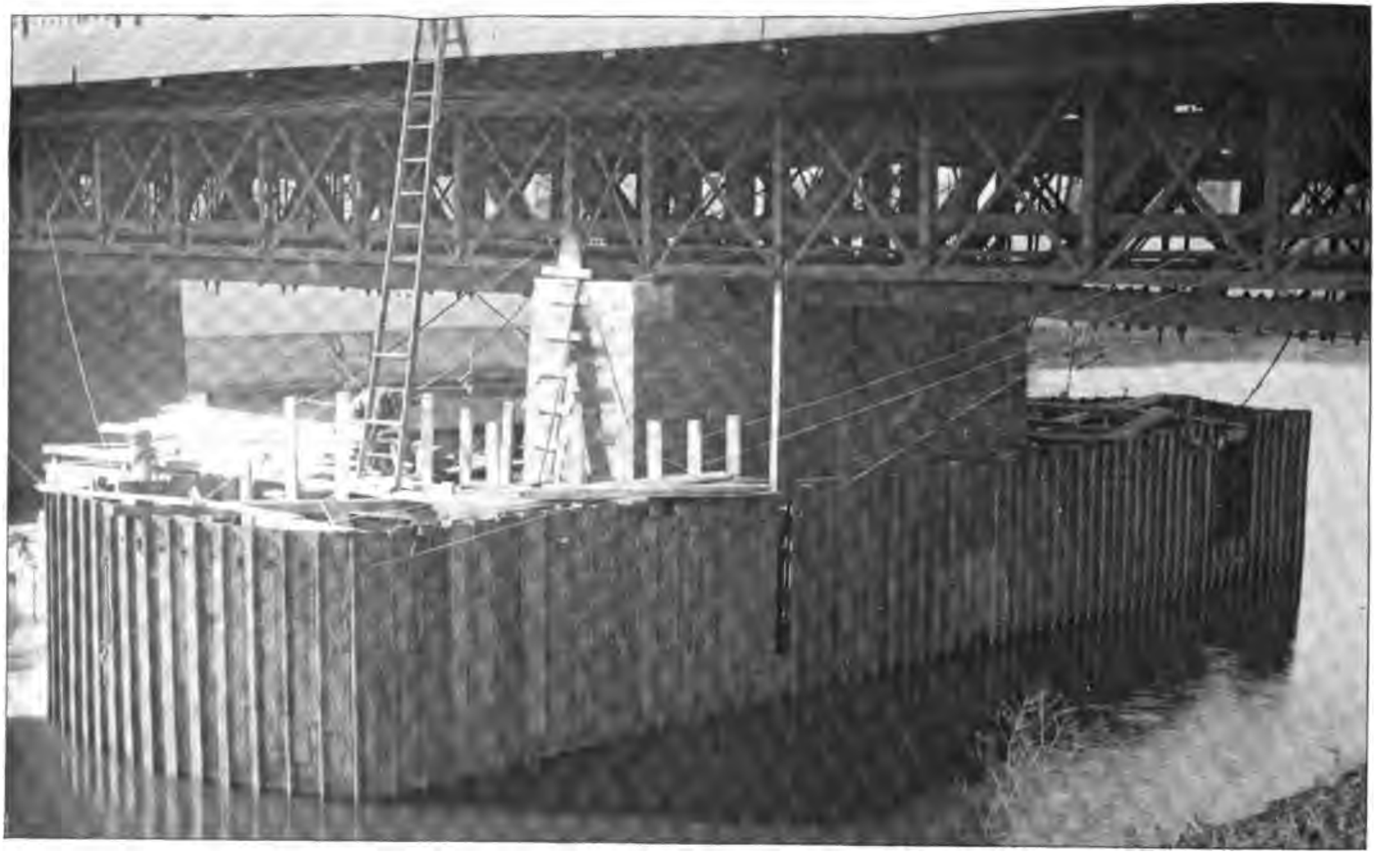
"The following table gives the summary of work done during the year and the total completed to date:

ITEMS OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Excavation.....cu. yds.	50,100	46,805	48,905	93.4	97.6
Sheeting and bracing.....ft. B. M.	121,000	7,120	7,120	5.8	5.8
Round timber bracing.....lin. ft.	510	586	586	114	114
Forming embankment.....cu. yds.	7,920	7,687	7,687	97	97
White oak in miter-sills and gates.....ft. B. M.	8,000	1,140	1,140	14.2	14.2
Second-class concrete.....cu. yds.	15,700	14,736	14,736	93.7	93.7
Fourth-class riprap.....cu. yds.	100	37	37	37	37
Structural steel.....lbs.	8,200	5,990	5,990	73	73
Metal reinforcement.....lbs.	8,000	8,000	8,000	100	100
Iron castings, plain.....lbs.	12,000	11,234	11,234	93.6	93.6
Iron castings, machined.....lbs.	7,000	6,360	6,360	90.8	90.8
Metal in lock-gates.....lbs.	218,000	11,827	11,827	5.4	5.4
Metal in buffer-beams.....lbs.	78,000	7,572	7,572	9.7	9.7
Metal in lock-valves.....lbs.	24,000	405	405	1.6	1.6
Drilling bolt holes in rock.....lin. ft.	500	324	324	64.8	64.8
Maintaining highway traffic.....lump sum	$250	$50	$50	20	20
Coffer-dams, pumping, bailing and draining..lump sum	$3,000	0	$2,475	0	82.5
Vitrified pipe and specials.....lin. ft.	500	428	428	85.6	85.6
Brick manholes.....No.	4	4	4	100	100
Excavation of concrete.....cu. ft.	26	15	15	100	100

Engineer's estimate, $200,500.
Contract price, including alterations, $167,385.
Total of all work done during year = 81 per cent of contract price.
Total of all work done to date = 81.5 per cent of contract price.

"*Contract No.* 78. Mark D. Ewell, Leveler, in charge. Cunningham-Woodard Co., Hudson Falls, N. Y., contractors.

"This work was put under contract on the 18th day of April, 1910, and work actually started in May. This contract consists of the building of a dike, which is the raising and widening of the present tow-path along the river from a similar dike constructed under contract No. 10, southerly for a distance of about 1.2 miles. This dike is to protect the territory behind it from overflowing in high-water time and after the upper dam at Fulton (No. 3) is raised five feet, as per existing contract No. 10. Material for this dike is being secured from a borrow pit located in a hill adjacent to the tow-path south of the contract. The extreme haul from this borrow pit to the north end of the contract is about two miles and as the northerly end of the dike is being first brought to grade, the



Barge Canal, Contract No. 79.

View showing progress of construction at Bridge street bridge, Oswego.

haul is constantly growing less and the output should correspondingly increase, as transportation is the governing factor on this work up to the present time. About 800 feet of the north end of the dike is to grade and about 3,000 feet more from 1 to 6 feet above the present tow-path.

"The river face of this dike is to be covered with wash wall for its entire length. The ditch which had to be constructed behind the dike is completed, with the exception of a little trimming. The 24-inch vitrified pipe drain about 650 feet long, which was necessary to care for certain drainage near the south end of the dike, is completed and the ditch at its north end has been connected with the existing 24-inch drain by the building of 40 feet of vitrified pipe drain with its accompanying head wall and manhole.

"The following table gives the summary of work done during the year and the total completed to date:

ITEMS OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Excavation .... cu. yds.	105,550	67,487	67,487	64	64
Embankment .... cu. yds.	91,430	57,251	57,251	62.6	62.6
Second-class concrete .... cu. yds.	44	40	40	90 6	90.6
Vitrified pipe, 24-in., laid .... lin. ft.	750	718	718	95.8	95.8
Manhole covers and grating .... lbs.	700	600	600	85.7	85.7
Wash wall .... cu. yds.	6,230	129	129	2.1	2.1
Additional manhole, exclusive of cover. lump sum.	$43	$43	$43	100	100
Trenching and backfilling .... lin. ft.	700	665	665	95	95

Engineer's estimate, $55,154.
Contract price, including alterations, $49,025.95.
Total of all work done during the year = 48 per cent of contract price.
Total of all work done to date = 48 per cent of contract price.

"*Contract No.* 79., Charles R. Chase, Assistant Engineer, in charge. Lupfer & Remick of Buffalo, N. Y., contractors.

"Under this contract two bridge spans are to built, one over the old canal and one over the adjacent new canal between the lower guide walls to lock No. 8, on Bridge street in Oswego. The city of Oswego has let a contract for the rebuilding of the remainder of this bridge and work is now in progress on both of these contracts. The contractors began work in September, 1910, and have taken out a small amount of excavation, amounting to about $70, up to the end of the month.

" The following table gives the summary of work done during the year and the total completed to date:

ITEM OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Excavation.........................cu. yds.	1,600	70	70	4.37	4.37

Engineer's estimate, $39,735.
Contract price, $36,180.
Total of work done during the year = 0.193 per cent of the contract price.
Total of work done to date = 0.193 per cent of the contract price.

" *Contract No.* 90. In charge of the Assistant Engineers under whom the work is being done. D'Olier Engineering Co., Philadelphia, Pa., contractors.

" Work under this contract was started on lock No. 8 at Oswego in August, but no work could be estimated until September, owing to the method of payment. Reinforced, double-duct conduit has been laid the entire length of the east wall of this lock and a portion of the upper east guide wall.

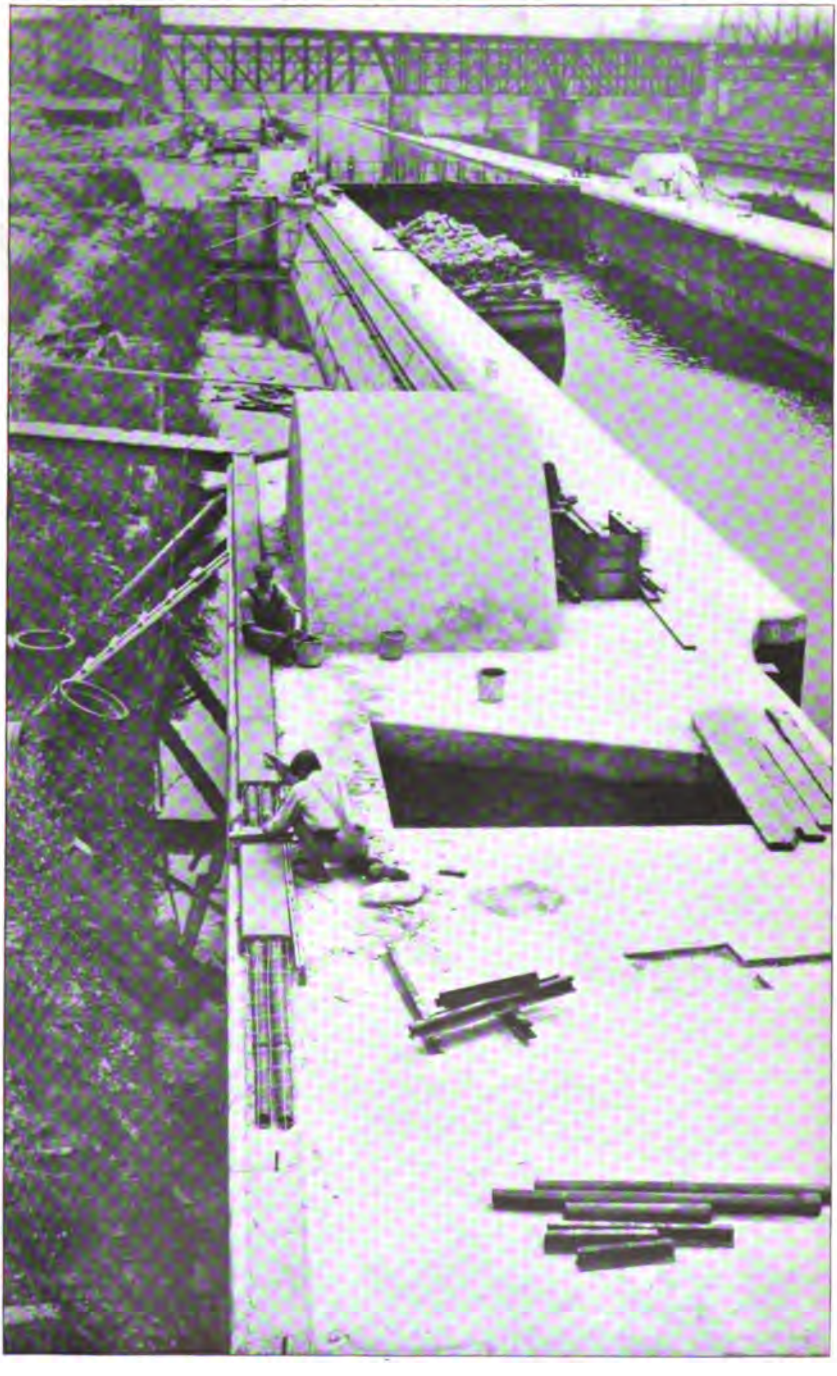
" The contractors have built temporary offices at Phoenix and Fulton near the sites of locks Nos. 1 and 2, but have done no further work at these points.

" The following table gives the summary of work done during the year and the total completed to date:

ITEMS OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Metal ducts..........................lbs.	10,240	62	62	0.6	0.6
Reinforced concrete conduit, double-duct.lin. ft.	565	518	518	91.8	91.8
Drilling 1¼-in. holes for ducts..........lin. ft.	240	6	6	2.5	2.5

Total engineer's estimate, $180,630.
Total contract price, $178,197.
Contract price for portion on the Oswego river, $56,324.35 (estimated).
Total done during year = 2.64 per cent of contract price (based on $56,324.35).
Total done to date = 2.64 per cent of contract price (based on $56,324.35).

" *Highway contract.* This contract came into existence for the same reason that made it necessary to build the dike provided for under contract No. 78, namely, the highway had to be raised in order to prevent its being flooded after the upper dam at Fulton is raised. Since the plans were not out for this highway change



Barge Canal, Contract No. 90.

View showing progress on electric installation for operating machinery at siphon lock at Oswego.

at the time contract No. 78 was let, and, because the work on this highway is practically the same as that for the dike, and in view of the fact that the working of two gangs under two different contracts would have been provocative of much friction, unless separate borrow pits were provided for each piece of work, and further, inasmuch as a plant was already on the ground for doing the work on contract No. 78 and the contractors thereon were then employed in other portions of the county doing highway work, it was believed that the contractors for contract No. 78 could do this work more cheaply than any one else. The estimate of quantities was made by this Department and prices agreed upon between the contractors, the Superintendent of Public Works and the State Engineer and the work was let as a special contract during the summer. Construction started on the highway in September by grubbing and beginning embankment at the south end of the change near Keller's creek. A standard 10 by 10-foot concrete bridge is to be built over Keller's creek and the excavation for the foundation of this structure is complete and laying of grillage began the last day of September.

" The following table gives the summary of work done during the year and the total completed to date:

ITEM OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Excavation........................cu. yds.	22,000	1,045	1,045	4.75	4.75

Engineer's estimate, $11,627.50.
Contract price, $11,627.50.
Total of all work done during year = 2.66 per cent of contract price.
Total of all work done to date = 2.66 per cent of contract price.

WATER-SUPPLY RESIDENCY.

Resident Engineer L. C. Hulburd reports:

" This residency comprises the work for providing the additional water-supply required by the Barge canal for the Rome summit level. Through the maintaining of a portion of the existing canal, the present water-supply for the summit level of the Erie canal will be diverted into the Barge canal. From the several sources considered for obtaining an additional supply, the Mohawk river, West Canada creek and Nine Mile creek have been selected for immediate development, and during the past year the work of this residency has been confined to these projects. Present plans provide for a storage reservoir on the Mohawk river, formed by a dam about five miles north of Rome, which will impound about two billion seven hundred million cubic feet of water. Discharge pipes placed through the dam provide for drawing from the reservoir as required and the present Mohawk river channel will carry the water from the dam to the Barge canal at Rome. A second storage reservoir will be formed by a dam across West Canada creek at Hinckley, which will impound about three billion four hundred million cubic feet of water. Similar discharge pipes control the flow of water from this reservoir, but as West Canada creek is intercepted by the Barge canal at Herkimer, on a level below the summit, it is necessary to divert the water from the natural course of the creek, which will be accomplished by a small dam placed below the power house at Trenton falls, from which point an artificial channel about five and three-quarters miles long will convey the water to Nine Mile creek and thence along the natural bed of this creek to the summit level of the Barge canal at a point about midway between Utica and Rome. The construction required has been divided into three contracts as follows:

"*Contract No.* 50. For constructing a reservoir and dam on the West Canada creek and performing all other work appertaining to the contract.

"Previous to October 1, 1909, the preliminary topographical surveys and maps had been completed, materials examined by means of borings, test pits, etc., flow line, as computed from assumed maximum floods, located, and surveys made over the boundary lines of property which will be flooded.

"During the past year the limits of properties to be appropriated have been located on the ground and marked with 325 carefully established points; traverse surveys for 190 properties to be appropriated, with a total of 4,742 acres, have been balanced and areas computed; searches have been carried on for determining titles to various properties; an appropriation index map has been prepared and tracings for sixty per cent of the parcels to be appropriated have been completed.

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"The construction required by this contract consists in clearing the site of the reservoir, including the removal of 209 principal buildings with their out-buildings, cutting of brush and trees and removal of fences, building of a masonry spillway 400 feet long with a crest elevation 75 feet above the present creek bed, building of masonry abutments at ends of spillway, in which are placed four 60-inch and two 42-inch discharge pipes with controlling gates, valves, etc., and the building of an earthen embankment, with masonry core wall connecting the abutments with the high ground forming the limits of the reservoir. The earthen embankment is about 3,200 feet long with a maximum height of about 47 feet and a top elevation fifteen feet above the crest of the spillway.

"The contract for this work was awarded to the Buffalo Dredging Co. on September 23, 1910, but up to October 1 no construction work has been done.

"*Contract No.* 51. For constructing a diverting dam on West Canada creek and a feeder to Nine Mile creek watershed.

"Previous to October 1, 1909, topographic surveys and maps over the proposed location of feeder line had been completed; a location had been made on the ground and cross-sections taken; the material had been examined by means of borings and test pits, and maps had been prepared covering the property to be acquired for the proposed dam and feeder entrance.

"During the past year further studies have been made at the proposed intake, including about one hundred feet of drive rod soundings and three hundred feet of wash drill borings. A preliminary estimate of the clearing to be done along the proposed line has been rendered and various minor reports and studies made.

"*Contract No.* 55. For constructing Delta reservoir, including the clearing of the site, the construction of a dam, the relocation of 1.9 miles of Black River canal, with four locks and aqueduct over the Mohawk river, highway change, bridge, etc.

"This contract was awarded to Arthur McMullen on October 19, 1908. Construction work was begun immediately and has been carried on continuously to date. Practically all of the timber has been cut, about 60 per cent of the brush and scattering trees cleared and about 10 per cent of the buildings removed.

" The excavation of prism for the Black River canal north of the flight of locks was completed in February of this year, excepting the connection with existing canal, which cannot be made until the old canal may be abandoned. In completing the prism there remains about fifteen thousand cubic yards of embankment to be placed, which will be obtained from borrow.

" The excavation for foundation of main dam is complete, except for about 250 feet and 90 per cent of the excavation on this uncompleted portion has been done.

" Excavation for the flight of locks was progressed nearly to completion, but the character of the rock, as developed in the excavation, was such that it seemed best to abandon the original plan of a facing wall, doweled to the rock, and an alteration was prepared providing for gravity sections of lock walls. This required an additional width of excavation which has been completed on lock No. 10 and is well under way on locks Nos. 8 and 9. The placing of concrete in the flight of locks was commenced on September 16. The approach walls and one section in each chamber wall of lock No. 10 have been completed.

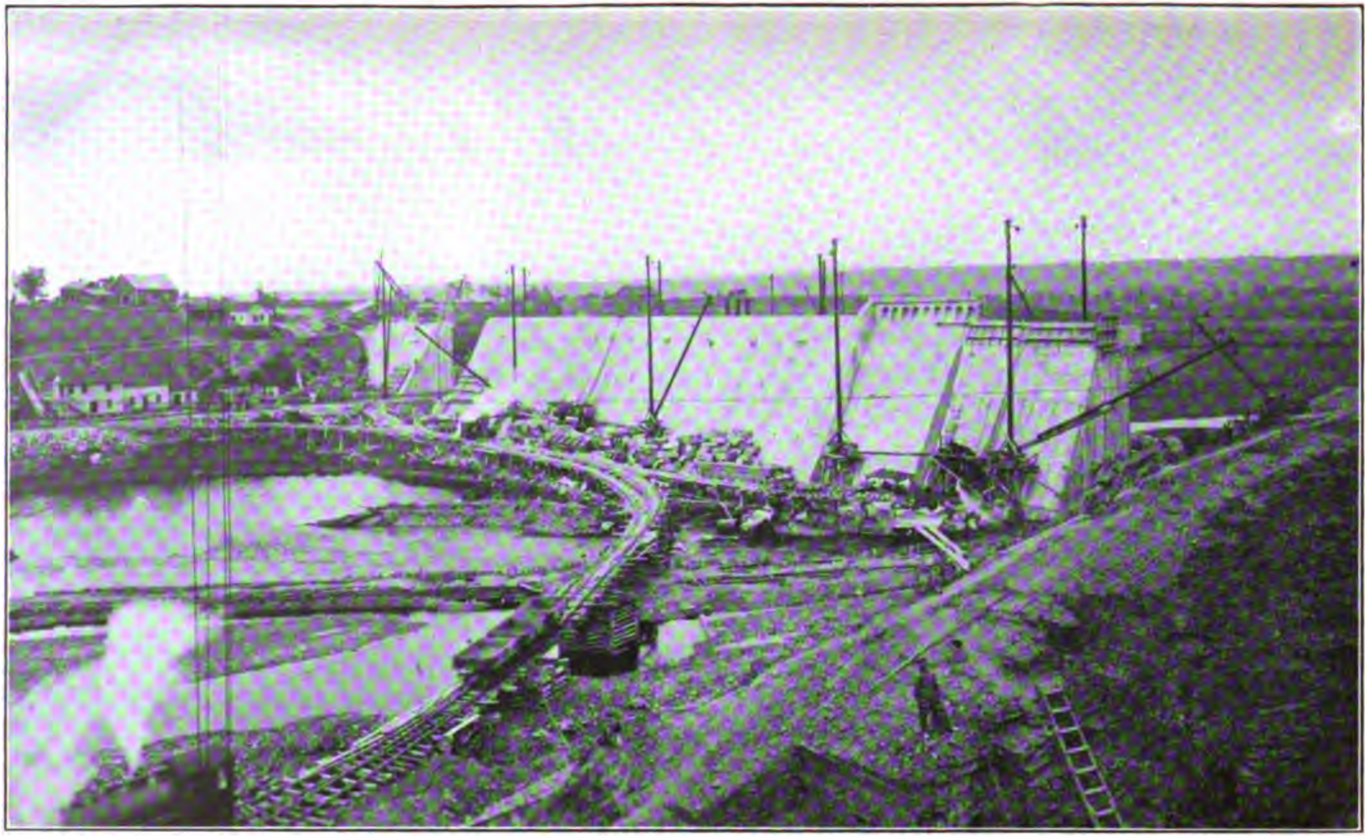
"At the aqueduct the excavation for foundation of pier No. 2 has been completed and piers Nos. 3, 4 and 5 and the west abutment are finished.

" Lock No. 7, with its approach walls and the highway change bridge, were completed and put in service upon the opening of navigation last spring. In order to permit the construction of lock No. 7 before the balance of the new canal was ready for operation the contractor has built, without expense to the State, a temporary embankment carrying the pool above old lock No. 7 to the upper end of the new lock.

"At the main dam the spillway section, 300 feet long, and 161½ feet of the bulkhead section have been completed; foundation has been laid and the placing of masonry is under way in eight additional sections with a total length of 265 feet; the four 60-inch discharge pipes with sluice-gates and valves have been placed.

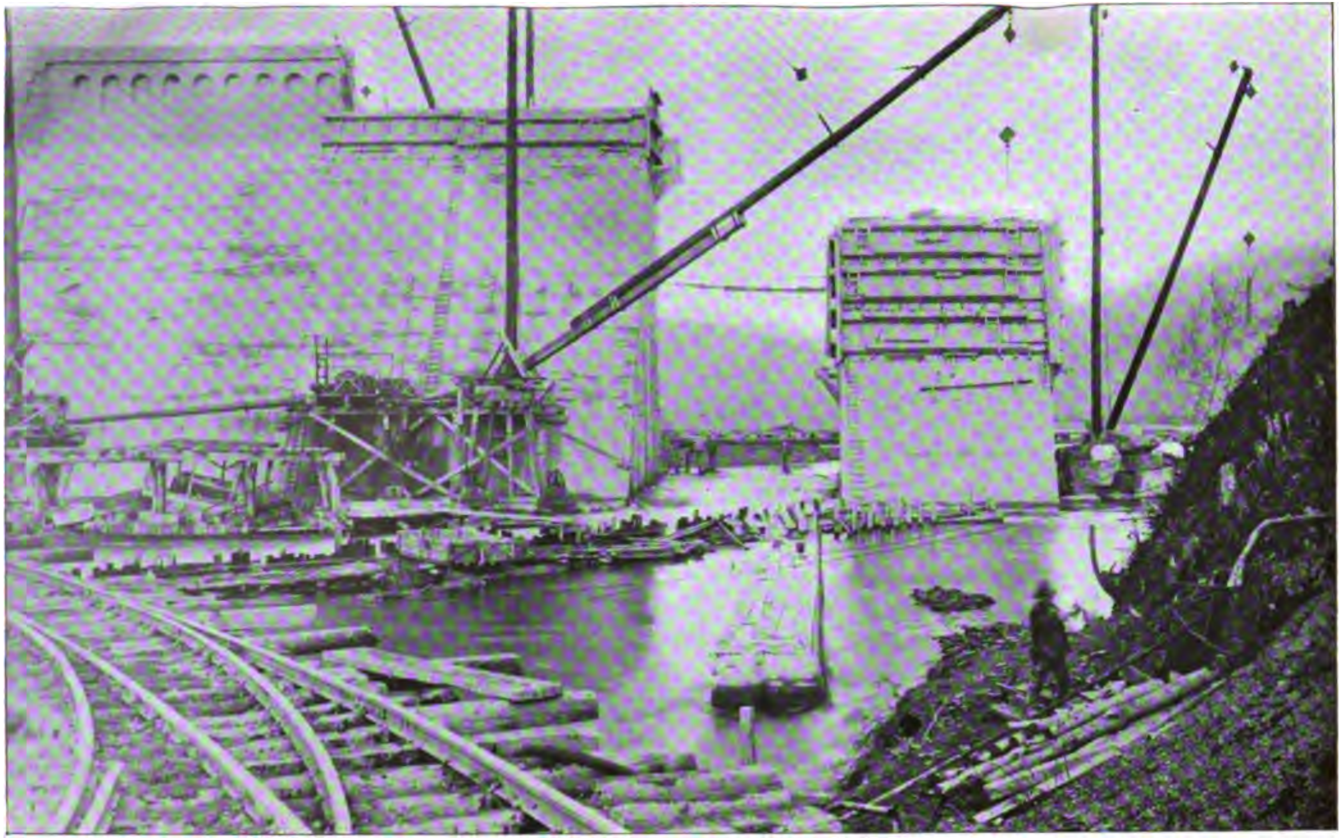
" The greater portion of the materials for the completion of the structures in this contract has been delivered.

" The placing of monuments at angle points in the perimeter of the reservoir site has been completed. There are 211 of these



Barge Canal, Contract No. 55.

The dam near Delta, which will hold back the waters of the upper Mohawk and create a new reservoir for supplying the Rome summit level.



Barge Canal, Contract No. 55.
Eastern end of dam at Delta reservoir.

monuments, numbered consecutively, beginning at the west end of the dam and progressing clock-wise. In the top of each monument is set a copper plate, on which is stenciled the number and the inscription: 'N. Y. DELTA RES. PROP. MON.'

"About ten miles of highway will be submerged by this reservoir and in order to connect the 'dead ends' about five miles of new highway will be required. Surveys and plans for the highways required have been completed. The construction of these highways is not included under contract No. 55.

"The following table, including alterations to date, shows the progress of construction:

ITEMS OF WORK.	Preliminary estimate, including alterations.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing.......lump sum	....	46%	52%	46	52
Grubbing.......cu. yds.	6,600	1,766	5,136	26.8	77.8
Excavation.......cu. yds.	355,200	129,804	288,751	36.5	81.3
Sheeting and bracing.......ft. B. M.	20,000	11,665	20,000	58.4	100
Channeling.......sq. ft.	25,200	7,265	7,265	28.8	28.8
Forming embankment.......cu. yds.	160,550	44,030	91,799	27.4	57.2
Puddle.......cu. yds.	820	158	158	19.2	19.2
Sawed lumber.......ft. B. M.	27,000	6,658	6,658	24.7	24.7
Round timber bracing.......lin. ft.	1,000	231	398	23.1	39.8
Second-class concrete.......cu. yds.	21,600	5,597	7,471	25.9	34.6
Reinforced concrete.......cu. yds.	927	4	4	0.4	0.4
Cyclopean masonry.......cu. yds.	85,400	41,777	55,939	48.9	65.5
Cast iron pipe and specials.......lbs.	290,000	258,429	258,429	89.1	89.1
Structural steel.......lbs.	79,160	32,368	32,368	40.9	40.9
Metal reinforcement.......lbs.	53,970	2,643	2,718	4.9	5
Wrought iron.......lbs.	5,200	596	596	11.4	11.4
Iron castings, plain.......lbs.	34,000	5,708	5,708	16.8	16.8
Iron castings, machined.......lbs.	81,400	58,279	58,279	71.6	71.6
Metal in lock-valves.......lbs.	5,700	907	907	15.9	15.9
Wrought iron pipe railing.......lin. ft.	1,780	16	16	0.9	0.9
Drilling bolt holes.......lin. ft.	900	540	554	60	61.6
Sluice-gate apparatus, valves, etc....lump sum	....	81%	81%	81	81
Coffer-dams, pumping, bailing, etc...lump sum	....	20%	22%	20	22
Gross estimate..........	$944,626	$377,800	$579,410	40	61.3

Cayuga and Seneca Canal Residency.

Resident Engineer James Burden reports:

"At the November election in 1909 it was voted to appropriate seven million dollars for the improvement of the Cayuga and Seneca canal. In the beginning of December an office was opened in Albany for the preparation of estimates of various routes and the preparation of contract drawings. Maps, profiles and cross-sections were prepared and about two thousand borings and drive rod soundings plotted on the various routes. Estimates of cost have been made from Montezuma to deep water in Cayuga lake

(9.5 miles), from Free bridge to Dumont bridge (1.9 miles), from Mud lock to Dumont bridge (1.5 miles), from Dumont bridge along the Seneca river to Seneca lake (13.6 miles) and on a route between Cayuga and Seneca lakes to the south of Seneca Falls and Waterloo (12 miles). Estimates were also made on several routes between Seneca lake and Lyons (13.5 miles) and between Seneca lake and Creager's bridge (12.5 miles), including two with summit levels to be supplied by feeder canals from a proposed dam on the Canandaigua outlet at Phelps. Included in the estimate of these high level routes is the regulation of Canandaigua lake. Several modifications of each of these routes were considered.

" Contract drawings are under way for the work from the Barge canal at Montezuma to deep water in Cayuga lake, but the route to Seneca lake has not yet been decided upon.

"A thorough search of the records of the Court of Claims has been made to aid in determining the water rights of owners along the Seneca river and the existing location of the blue line. The blue line as far as ascertained has been plotted."

IN CONCLUSION.

I desire to thank you and your deputies, Mr. Harry W. DeGraff and Mr. Wm. B. Landreth, together with the Resident Engineers and other subordinate officers and employees of the Department for the courtesy, consideration and support shown me in the discharge of my official duties.

Respectfully submitted,

GUY MOULTON,
Division Engineer.

The Following Statements Show the Names, Rank and Compensation of Engineers Employed in the Middle Division of the Department of the State Engineer and Surveyor, Together with Incidental Expenses, for the Fiscal Year Ended September 30, 1910.

Ordinary Repairs — Erie Canal.

Chapter 432, Laws of 1909.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Guy Moulton	Division engineer	$350 00 per month	$950 00	$4 65	$954 65
Fred J. Wagner	First resident engineer	250 00 per month	475 00	40 32	515 32
Henry L. Bassett	Financial clerk	150 00 per month	970 00		970 00
W. S. Morris	Estimate clerk	125 00 per month	295 00	5 75	300 75
Harvey Wagner	Stenographer	100 00 per month	800 00		800 00
L. D. Brownell	Assistant engineer	6 00 per day	594 00	57 31	651 31
D. E. Whitford	Assistant engineer	6 00 per day	1,110 00		1,110 00
E. M. Ellis	Assistant engineer	6 00 per day	144 00	8 18	152 18
N. R. McLoud	Leveler	5 00 per day	25 00		25 00
R. K. Sheldon	Leveler	5 00 per day	40 00		40 00
F. A. Gordon	Rodman	4 00 per day	20 00		20 00
Carl F. Hopstein	Draftsman	5 00 per day	335 00	38 01	373 01
John Connors	Laborer	2 00 per day	626 00		626 00
Clark H. Norton	Laborer	2 00 per day	626 00		626 00
L. W. Moulton	Laborer	2 00 per day	122 00		122 00
F. B. Ostrander	Laborer	2 00 per day	108 00		108 00
W. C. Moulton	Laborer	2 00 per day	14 00		14 00
T. J. Aldcorn	Laborer	2 00 per day	6 00		6 00
			$7,260 00	$154 22	$7,414 22
Incidental Expenses.					
Livery				$2 50	
Stationery and printing				98 41	
Fuel and light				421 06	
Postage				193 13	
Telephone and telegraph				222 36	
Miscellaneous				520 02	
					1,457 48
Total					$8,871 70

Ordinary Repairs — Black River Canal.

Chapter 432, Laws of 1909.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
R. R. Stuart	Assistant engineer	$6 00 per day	$54 00	$14 40	$68 40

Ordinary Repairs — Cayuga and Seneca Canal.

Chapter 432, Laws of 1909.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
L. D. Brownell	Assistant engineer	$6 00 per day	$18 00	$21 30	$39 30
C. F. Hopstein	Draftsman	5 00 per day	10 00	4 29	14 29
L. W. Moulton	Laborer	2 00 per day	6 00		6 00
			$34 00	$25 59	$59 59
Incidental Expenses.					
Telephone and telegraph				$0 25	
Miscellaneous				06	
					31
Total					$59 90

Construction of Barge Canal — Erie Canal.

Chapter 147, Laws of 1903, and amendatory laws.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Guy Moulton	Division engineer	$350 00 per month	$1,500 00	$291 88	$1,791 88
Fred J. Wagner	First resident engineer	250 00 per month	1,575 00	161 92	1,736 92
S. M. Savage	Resident engineer	250 00 per month	91 67	1 10	92 77
Edwin Styring	Resident engineer	225 00 per month	2,625 00	132 59	2,757 59
L. C. Hulburd	Resident engineer	225 00 per month	2,625 00	227 09	2,852 09
D. C. Wedgeworth	Resident engineer	200 00 per month	2,048 00	85 52	2,133 52
Waldo G. Wildes	Resident engineer	200 00 per month	1,181 16	367 22	1,548 38
E. M. Ellis	Assistant engineer	6 00 per day	918 00	46 52	964 52
W. A. Lafler	Assistant engineer	6 00 per day	1,926 00	322 32	2,248 32
Daniel B. Donovan	Assistant engineer	6 00 per day	1,878 00	151 66	2,029 66
J. G. Palmer	Assistant engineer	6 00 per day	1,896 00	198 28	2,094 28
Geo. H. Haley	Assistant engineer	6 00 per day	246 00	....	246 00
Louis A. Burns	Assistant engineer	6 00 per day	708 00	....	708 00
C. H. Rogers	Assistant engineer	6 00 per day	1,884 00	270 39	2,154 39
Geo. H. Briggs	Assistant engineer	6 00 per day	1,696 00	194 48	1,890 48
W. J. Durkan	Assistant engineer	5 50 per day	1,423 50	39 76	1,463 26
H. C. Smith	Assistant engineer	6 00 per day	946 50	....	946 50
A. G. Crysler	Assistant engineer	6 00 per day	1,878 00	110 07	1,988 07
R. R. Stuart	Assistant engineer	6 00 per day	1,680 00	110 28	1,790 28
Carl L. Bannister	Assistant engineer	6 00 per day	1,878 00	13 74	1,891 74
Chas. W. Costello	Assistant engineer	6 00 per day	1,896 00	29 75	1,925 75
H. J. O'Neil	Assistant engineer	5 00 per day	1,575 00	26 45	1,601 45
R. K. Sheldon	Leveler	5 00 per day	1,525 00	58 40	1,583 40
Edward J. Berry	Leveler	5 00 per day	1,310 00	65 55	1,375 55
R. W. Cady	Leveler	5 00 per day	1,413 50	....	1,413 50
W. S. Saxton	Leveler	5 00 per day	840 50	....	840 50
N. R. McLoud	Leveler	5 00 per day	1,365 00	22 21	1,387 21
Albert G. Card	Leveler	5 00 per day	1,570 00	....	1,570 00
John F. Greathead	Leveler	5 00 per day	1,235 00	....	1,235 00
A. W. Smith	Leveler	5 00 per day	1,565 00	....	1,565 00
D. J. Levinson	Leveler	5 00 per day	1,461 00	....	1,461 00
Chas. Donohue	Leveler	4 50 per day	1,413 00	14 20	1,427 20
Arch M. Snow	Leveler	4 50 per day	490 50	....	490 50
D. W. Overacker	Leveler	5 00 per day	30 00	....	30 00
Foster B. Crocker	Leveler	5 00 per day	1,160 00	....	1,160 00
J. B. Whipple	Leveler	5 00 per day	953 50	....	953 50
I. S. Badger	Leveler	4 50 per day	1,215 50	....	1,215 50
M. D. Ewell	Leveler	4 50 per day	207 00	....	207 00
A. B. Cudebec	Leveler	4 50 per day	229 50	....	229 50
R. E. Swinney	Leveler	4 50 per day	193 50	....	193 50
H. J. Scheurman	Leveler	4 50 per day	....	4 86	4 86
Geo. H. Thomas	Rodman	4 00 per day	1,352 00	....	1,352 00
F. A. Gordon	Rodman	4 00 per day	1,092 00	....	1,092 00
J. A. Sloat	Rodman	4 00 per day	1,174 00	....	1,174 00
I. H. Smallwood	Rodman	4 00 per day	1,264 00	....	1,264 00
Palmer C. Gallup	Rodman	4 00 per day	1,252 00	....	1,252 00
P. H. Budd	Rodman	4 00 per day	833 00	....	833 00
R. W. Smith	Rodman	3 50 per day	157 50	....	157 50
S. P. Hendricks	Rodman	3 50 per day	7 00	....	7 00
John J. Gawkins	Rodman	3 50 per day	935 00	....	935 00
A. T. Madison	Rodman	3 50 per day	157 50	....	157 50
Wm. B. Cook	Rodman	3 50 per day	497 00	....	497 00
Frank J. Martin	Rodman	3 50 per day	315 00	....	315 00
W. W. Moyer	Rodman	3 50 per day	241 50	....	241 50
J. J. Stevens	Rodman	3 50 per day	322 00	....	322 00
Sylvester Sheridan	Rodman	3 50 per day	17 50	2 50	20 00
W. W. Wohglemuth	Rodman	3 50 per day	409 50	....	409 50
E. J. Clohessey	Rodman	3 50 per day	63 00	....	63 00
L. H. Rutherford	Rodman	3 50 per day	154 00	....	154 00
Wm. H. Morris	Rodman	3 50 per day	122 50	....	122 50
Max Goodman	Rodman	3 50 per day	80 50	....	80 50
J. L. Doyle	Rodman	3 50 per day	80 50	....	80 50
Henry C. Little	Chainman	3 00 per day	936 00	144 17	1,080 17
L. A. Kavanagh	Chainman	3 00 per day	951 00	....	951 00
Don A. Wilcox	Chainman	3 00 per day	954 00	....	954 00
Frank Lutz	Chainman	3 00 per day	957 00	....	957 00
Harry C. Smith	Chainman	3 00 per day	585 00	....	585 00
H. P. O'Bryan	Chainman	3 00 per day	444 00	....	444 00
John J. Phalan	Chainman	2 50 per day	706 00	....	706 00
J. P. Mullen	Chainman	2 50 per day	290 00	....	290 00
P. K. Lighthall	Chainman	2 50 per day	167 50	....	167 50
P. H. Woodworth	Chainman	2 50 per day	122 50	....	122 50
Roy Engell	Chainman	2 50 per day	110 00	....	110 00

Construction of Barge Canal — Erie Canal —(Continued).

Chapter 147, Laws of 1903, and amendatory laws.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Henry L. Bassett	Financial clerk	$150 00 per month	$435 00		$435 00
W. S. Morris	Estimate clerk	125 00 per month	758 00	$23 32	781 32
Harvey Wagner	Stenographer	100 00 per month	250 00		250 00
L. J. Mulhauser	Stenographer	100 00 per month	1,166 66		1,166 66
Fanny L. Borden	Stenographer	50 00 per month	8 33		8 33
C. F. Hopstein	Draftsman	5 00 per day	1,030 00	151 81	1,181 81
R. M. Fraser	Draftsman	4 50 per day	1,420 50		1,420 50
I. H. Segal	Draftsman	4 00 per day	492 00		492 00
W. J. Kelly	Inspector	5 00 per day	1,650 00		1,650 00
S. M. Stuart	Inspector	5 00 per day	1,590 00		1,590 00
W. A. Walter	Inspector	4 50 per day	441 00	4 92	445 92
H. W. Stoneburg	Foreman of borings	4 00 per day	88 00	13 25	101 25
Oscar Svenson	Boatman	3 00 per day	939 00		939 00
T. J. Aldcorn	Boatman	3 00 per day	681 00		681 00
F. R. Simmonds	Boatman	3 00 per day	741 00		741 00
A. H. Withey	Boatman	3 00 per day	369 00		369 00
Chas. Rogers	Boatman	3 00 per day	471 00		471 00
J. H. McCabe	Boatman	3 00 per day	75 00		75 00
Morris Podolsky	Axeman	2 00 per day	72 00	12 08	84 08
W. T. Marriott	Axeman	2 00 per day	630 00		630 00
H. W. Loftus	Axeman	2 00 per day	626 00		626 00
Geo. E. Sweeting	Axeman	2 00 per day	618 00		618 00
G. L. Gollands	Axeman	2 00 per day	42 00		42 00
A. Moosbrugger	Axeman	2 00 per day	78 00		78 00
Lyle Stillman	Axeman	2 00 per day	96 00		96 00
Spencer B. Randall	Laborer	2 00 per day	630 00		630 00
Joseph F. O'Brien	Laborer	2 00 per day	630 00		630 00
James Keating	Laborer	2 00 per day	546 00		546 00
P. Kappesser	Laborer	2 00 per day	452 00		452 00
Joseph Reh	Laborer	2 00 per day	642 00		642 00
W. T. Tanner	Laborer	2 00 per day	486 00		486 00
Harry March	Laborer	2 00 per day	114 00		114 00
Bert Forbes	Laborer	2 00 per day	592 00		592 00
F. B. Ostrander	Laborer	2 00 per day	470 00		470 00
L. W. Moulton	Laborer	2 00 per day	116 00		116 00
George Grogan	Laborer	2 00 per day	604 00		604 00
Michael McAndrews	Laborer	2 00 per day	88 00		88 00
W. J. Ryan	Laborer	2 00 per day	364 00		364 00
Warren E. Miles	Laborer	2 00 per day	106 00		106 00
Wm. Farrier	Laborer	2 00 per day	628 00		628 00
Wm. Bird	Laborer	2 00 per day	52 00		52 00
G. F. Reynolds	Laborer	2 00 per day	34 00		34 00
U. C. Zeluff	Laborer	2 00 per day	52 00		52 00
John C. McElroy	Laborer	2 00 per day	268 00		268 00
A. H. Andrews	Laborer	2 00 per day	138 00		138 00
W. M. Branch	Laborer	2 00 per day	168 00		168 00
H. M. Selling	Laborer	2 00 per day	162 00		162 00
Samuel Sisbower	Laborer	2 00 per day	16 00		16 00
LeRoy A. White	Laborer	2 00 per day	288 00		288 00
John Irenbeck	Laborer	2 00 per day	24 00		24 00
Stanley Evenden	Laborer	2 00 per day	4 00		4 00
Alfred Keller	Laborer	2 00 per day	42 00		42 00
John E. Fitzsimmons	Laborer	2 00 per day	28 00		28 00
Chas. Knittle	Laborer	2 00 per day	24 00		24 00
Alfred White	Laborer	2 00 per day	24 00		24 00
Guy Jones	Laborer	2 00 per day	72 00		72 00
J. A. Smith	Laborer	2 00 per day	52 00		52 00
Lerrence Cooney	Laborer	2 00 per day	132 00		132 00
Chas. Brannock	Gage reader	10 00 per month	120 00		120 00
Louis McArthur	Gage reader	10 00 per month	120 00		120 00
John Hathorn	Gage reader	10 00 per month	27 30		27 30
Marie Brandt	Gage reader	7 00 per month	84 00		84 00
Mrs. A. H. Hoffmeister	Gage reader	7 00 per month	84 00		84 00
Bessie C. Kellogg	Gage reader	7 00 per month	84 00		84 00
Maria Powell	Gage reader	7 00 per month	84 00		84 00
Daniel Brown	Gage reader	7 00 per month	84 00		84 00
John Carroll	Gage reader	7 00 per month	84 00		84 00
W. T. Crill	Gage reader	7 00 per month	84 00		84 00
W. B. Dempsey	Gage reader	7 00 per month	84 00		84 00
E. A. Hurlburt	Gage reader	7 00 per month	84 00		84 00
H. F. Mason	Gage reader	7 00 per month	84 00		84 00
Henry Straub	Gage reader	7 00 per month	84 00		84 00
Griff G. Williams	Gage reader	7 00 per month	84 00		84 00

Construction of Barge Canal — Erie Canal —(Concluded).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
A. Demont	Gage reader	$7 00 per month	$21 00		$21 00
Geo. W. Graves	Gage reader	7 00 per month	10 97		10 97
Solomon Walts	Gage reader	7 00 per month	84 00		84 00
John R. Hiller	Gage reader	7 00 per month	80 00		80 00
A. H. O'Reilly	Gage reader	7 00 per month	21 00		21 00
Daniel Havens	Gage reader	7 00 per month	33 00		33 00
John Phillips	Gage reader	6 00 per month	72 00		72 00
Chas. Bourke	Gage reader	5 00 per month	60 00		60 00
Frank Burns	Gage reader	5 00 per month	60 00		60 00
W. H. Dunn	Gage reader	5 00 per month	60 00		60 00
John Chamberlain	Gage reader	5 00 per month	60 00		60 00
W. M. Hubbard	Gage reader	5 00 per month	60 00		60 00
Mark Kennedy	Gage reader	5 00 per month	60 00		60 00
Frank Shane	Gage reader	5 00 per month	60 00		60 00
Wm. Prettie	Gage reader	5 00 per month	60 00		60 00
Mark Quimby	Gage reader	5 00 per month	60 00		60 00
J. H. Rupert	Gage reader	5 00 per month	60 00		60 00
E. A. Evans	Gage reader	5 00 per month	60 00		60 00
John P. Watts	Gage reader	5 00 per month	60 00		60 00
L. W. Moulton	Gage reader	5 00 per month	28 17		28 17
W. Van Kirk	Gage reader	5 00 per month	15 00		15 00
Chris Hannon	Gage reader	4 00 per month	48 00		48 00
Chas. Swan	Livery			$346 50	346 50
Geo. H. Shufelt	Livery			330 00	330 00
David Butler	Livery			66 00	66 00
A. T. Noonan Auto. Co.	Livery			47 00	47 00
Cronin Auto. Co.	Livery			24 00	24 00
			$94,226 26	$4,111 79	$98,338 05

Incidental Expenses.

Instruments and tools	$311 57	
Office rent	931 67	
Fuel and light	407 99	
Stationery and printing	124 07	
Postage	225 96	
Telephone and telegraph	652 74	
Miscellaneous	4,946 74	
		7,600 74
Total		$105,938 79

Construction of Barge Canal — Oswego Canal.

Chapter 147, Laws of 1903, and amendatory laws.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Guy Moulton	Division engineer	$350 00 per month	$1,500 00	$80 46	$1,580 46
T. M. Ripley	Resident engineer	225 00 per month	2,625 00	605 57	3,260 57
Geo. C. Andrews	Assistant engineer	6 00 per day	1,866 00	124 82	1,990 82
Geo. H. Haley	Assistant engineer	6 00 per day	1,650 00	139 21	1,789 21
Louis A. Burns	Assistant engineer	6 00 per day	1,170 00	17 18	1,187 18
E. M. Ellis	Assistant engineer	6 00 per day	372 00	57 94	429 94
G. H. Thomson	Assistant engineer	6 00 per day	666 00	20 45	686 45
R. R. Stuart	Assistant engineer	6 00 per day	156 00	7 75	163 75
Chas. R. Chase	Assistant engineer	6 00 per day	282 00	22 12	304 12
E. J. Berry	Leveler	5 00 per day	485 00	29 09	514 09
M. D. Ewell	Leveler	4 50 per day	670 50	25 91	696 41
Frank H. Flint	Leveler	5 00 per day	1,543 50		1,543 50
H. H. Brown	Leveler	5 00 per day	1,586 50		1,586 50
D. H. Judson	Leveler	5 00 per day	1,488 00		1,488 00
R. E. Swinney	Leveler	4 50 per day	1,246 50		1,246 50
Foster B. Crocker	Leveler	5 00 per day	415 00		415 00
P. H. Budd	Leveler	4 50 per day	349 00		349 00
E. A. Dollard	Leveler	4 50 per day	771 50		771 50
G. C. Hannon	Leveler	4 50 per day	1 301 50		1,301 50
W. H. Hilborn	Leveler	4 50 per day	1,126 00		1,126 00
W. C. R. Pyne	Rodman	4 00 per day	782 00		782 00

Construction of Barge Canal — Oswego Canal — (Concluded).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
W. S. Morris	Rodman	$4 00 per day	$420 00	$2 35	$422 35
Karl Moulton	Rodman	3 50 per day	119 00		119 00
L. H. Wright	Rodman	3 50 per day	423 50		423 50
M. L. Mackey	Rodman	3 50 per day	80 50		80 50
E. J. Clohessy	Rodman	3 50 per day	259 00		259 00
G. F. Baker	Rodman	3 50 per day	84 00		84 00
J. C. Adams	Chainman	3 00 per day	954 00		954 00
Frank W. Donovan	Chainman	2 50 per day	390 00		390 00
W. W. Redfern	Chainman	2 50 per day	10 00		10 00
Harry C. Smith	Chainman	3 00 per day	129 00		129 00
M. J. Chryst	Chainman	2 50 per day	126 00		126 00
J. E. Smith	Chainman	2 50 per day	695 00		695 00
Carl F. Hopstein	Draftsman	5 00 per day	170 00	63 62	233 62
Harry Kehoe	Draftsman	4 50 per day	1,408 50		1,408 50
H. A. J. Castor	Draftsman	5 00 per day	1,530 00		1,530 00
C. G. Lamphere	Tracer	75 00 per month	525 00		525 00
H. E. Brainard	Bridge designer	175 00 per month	91 93		91 93
E. G. Semon	Bridge designer	125 00 per month	85 75	6 51	92 26
W. N. Dutcher	Inspector	5 00 per day	1,651 00		1,651 00
A. H. Hallenbeck	Inspector	4 50 per day	1,521 00		1,521 00
W. A. Walter	Inspector	4 50 per day	1,012 50		1,012 50
Henry L. Bassett	Financial clerk	150 00 per month	280 00		280 00
Harvey Wagner	Stenographer	100 00 per month	150 00		150 00
W. D. Gartland	Stenographer	50 00 per month	456 45		456 45
S. P. Van Waters	Stenographer	50 00 per month	130 64		130 64
Allen R. Lype	Boatman	3 00 per day	228 00		228 00
Wm. Craham	Axeman	2 00 per day	680 00		680 00
Frank Layburn	Axeman	2 00 per day	642 00		642 00
Alfred Moosbrugger	Axeman	2 00 per day	474 00		474 00
Thomas Keating	Axeman	2 00 per day	332 00		332 00
Leland W. Kesler	Axeman	2 00 per day	20 00		20 00
Isaac Kaufman	Axeman	2 00 per day	98 00		98 00
John Audlin	Laborer	2 00 per day	672 00		672 00
G. W. Jones	Laborer	2 00 per day	589 00		589 00
E. M. Bonner	Laborer	2 00 per day	554 00		554 00
John Dygert	Laborer	2 00 per day	284 00		284 00
Orville Siver	Laborer	2 00 per day	38 00		38 00
Lucien Clement	Laborer	2 00 per day	38 00		38 00
Alfred Moran	Laborer	2 00 per day	82 00		82 00
F. B. Ostrander	Laborer	2 00 per day	52 00		52 00
G. F. Reynolds	Laborer	2 00 per day	6 00		6 00
John Gilmore	Laborer	2 00 per day	16 00		16 00
L. W. Moulton	Laborer	2 00 per day	30 00		30 00
Harry G. Rose	Laborer	2 00 per day	22 00		22 00
Mathew Cosgrove	Laborer	2 00 per day	16 00		16 00
Fred McCarthy	Laborer	2 00 per day	15 00		15 00
Edward Mershon	Laborer	2 00 per day	28 00		28 00
Edward Finn	Laborer	2 00 per day	16 00		16 00
Daniel McMahon	Laborer	2 00 per day	12 00		12 00
Michael McMahon	Laborer	2 00 per day	10 00		10 00
Michael Flaherty	Laborer	2 00 per day	16 00		16 00
Joseph Driscoll	Laborer	2 00 per day	19 00		19 00
Robert E. Griffin	Laborer	2 00 per day	16 00		16 00
Frank M. Hughes	Gage reader	12 00 per month	144 00		144 00
Geo. Archambo	Gage reader	6 00 per month	72 00		72 00
Smith Sharp	Gage reader	5 00 per month	60 00		60 00
Arthur C. Owens	Gage reader	5 00 per month	60 00		60 00
B. M. Wilcox	Gage reader	5 00 per month	60 00		60 00
D. D. Tompkins	Gage reader	5 00 per month	60 00		60 00
L. D. Sterling	Gage reader	5 00 per month	60 00		60 00
Roy L. Smith	Gage reader	5 00 per month	50 00		50 00
W. W. Perry	Gage reader	5 00 per month	10 00		10 00
			$40,335 77	$1,202 98	$41,538 75

Incidental Expenses.

Instruments and tools	$40 93	
Office rent	925 96	
Fuel and light	156 77	
Stationery and printnig	60 95	
Postage	89 53	
Telephone and telegraph	294 33	
Miscellaneous	2,368 25	
		3,936 72
Total		$45,475 47

Construction of Barge Canal — Cayuga and Seneca Canal.

Chapter 391, Laws of 1909.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
James Burden	Resident engineer	$225 00 per month	$2,025 00	$43 71	$2,088 71
Dennis Madden	Expert	15 00 per day	465 00	27 63	492 63
J. H. Durham	Confidential assistant	333 33 per month	107 53	55 71	163 24
L. S. Hulburd	Assistant engineer	6 00 per day	1,218 00	379 17	1,597 15
H. C. Smith	Assistant engineer	6 00 per day	714 00	7 05	721 05
Harry A. Weeks	Assistant engineer	6 00 per day	270 00		270 00
M. W. Williams	Assistant engineer	6 00 per day	444 00	16 78	460 78
J. S. Clancy	Assistant engineer	6 00 per day	318 00		318 00
P. W. O'Grady	Assistant engineer	6 00 per day	138 00		138 00
G. E. Gibson	Assistant engineer	6 00 per day	396 00		396 00
B. I. Hall	Assistant engineer	5 50 per day	1,105 50		1,105 50
F. D. Porter	Assistant engineer	5 00 per day	815 00		815 00
G. G. Underhill	Assistant engineer	5 00 per day	165 00		165 00
D. A. Young	Leveler	5 00 per day	625 00		625 00
E. A. Duschak	Leveler	5 00 per day	980 00		980 00
W. S. Saxton	Leveler	5 00 per day	402 00	7 05	409 05
J. M. Prior	Leveler	4 50 per day	870 00		870 00
J. C. Cookingham	Rodman	3 50 per day	427 00	5 05	432 05
C. H. Hurley	Rodman	3 50 per day	374 50		374 50
R. G. Pratt	Rodman	4 00 per day	924 00		924 00
H. J. Stabile	Rodman	4 00 per day	676 50		676 50
S. D. Hendricks	Rodman	3 50 per day	343 00		343 00
P. S. Bolger	Rodman	3 50 per day	98 00		98 00
C. H. Adams	Rodman	3 50 per day	780 50		780 50
J. C. Sophian	Rodman	3 50 per day	374 50		374 50
Karl Moulton	Chainman	3 00 per day	455 00		455 00
G. E. Schaefer	Chainman	2 50 per day	267 50		267 50
H. J. Spelman	Chainman	2 50 per day	20 00		20 00
M. Tiefenbrun	Chainman	2 50 per day	87 50		87 50
G. E. Deutschbein	Chainman	2 50 per day	142 50		142 50
L. E. Moyer	Chainman	2 50 per day	491 00		491 00
E. A. Brainerd	Bridge designer	175 00 per month	29 17		29 17
S. T. Vosburg	Junior bridge designer	90 00 per month	14 52		14 52
Chas. E. Quimby	Junior bridge designer	75 00 per month	6 00		6 00
John Cosgrave	Architectual draftsman	125 00 per month	16 13		16 13
J. H. McCormick	Draftsman	4 50 per day	22 50		22 50
Jerry Ryan	Tracer	50 00 per month	5 00		5 00
H. Kramer	Foreman of borings	4 50 per day	936 00	144 14	1,080 14
H. W. Stoneburg	Foreman of borings	4 00 per day	744 00		744 00
J. J. Breuckel	Axeman	2 00 per day	166 00		166 00
J. H. McCabe	Boatman	3 00 per day	553 00		553 00
M. H. McConnell	Laborer	2 00 per day	378 00		378 00
H. O. Caldwell	Laborer	2 00 per day	262 00		262 00
L F. French	Laborer	2 00 per day	160 00		160 00
Thos. Welch	Laborer	2 00 per day	364 00		364 00
J.A. Smith	Laborer	2 00 per day	364 00		364 00
U. C. Zeluff	Laborer	2 00 per day	324 00		324 00
G. C. Curtis	Laborer	2 00 per day	38 00		38 00
C. E. Leonard	Laborer	2 00 per day	40 00		40 00
John Coleman	Laborer	2 00 per day	4 00		4 00
Wm. Marshall	Laborer	2 00 per day	416 00		416 00
Steve Childs	Laborer	2 00 per day	422 00		422 00
Wm. Childs	Laborer	2 00 per day	38 00		38 00
Claude Facer	Laborer	2 00 per day	40 00		40 00
E. A. Brooks	Laborer	2 00 per day	38 00		38 00
J. M. McDermott	Laborer	2 00 per day	264 00		264 00
J. A. Dougherty	Laborer	2 00 per day	86 00		86 00
B. W. Wende	Laborer	2 00 per day	4 00		4 00
Robert Byrnes	Laborer	2 00 per day	144 00		144 00
H. H. Joy	Laborer	2 00 per day	100 00		100 00
W. H. Grover	Gage reader	10 00 per month	80 00		80 00
A. Demont	Gage reader	7 00 per month	56 00		56 00
Geo. W. Graves	Gage reader	7 00 per month	56 00		56 00
Daniel Havens	Gage reader	7 00 per month	56 00		56 00
A. H. O'Reilly	Gage reader	7 00 per month	56 00		56 00
W. Van Kirk	Gage reader	5 00 per month	40 00		40 00
D. M. Kellogg	Livery			320 00	320 00

Construction of Barge Canal—Cayuga and Seneca Canal—(Con.)

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Frank Carter	Livery			$410 00	$410 00
H. G. Day	Livery			148 00	148 00
Baker Bros	Livery			31 00	31 00
Kelcher & Malone	Livery			29 00	29 00
			$22,841 85	$1,644 29	$24,486 14
	Incidental Expenses.				
Instruments and tools				$8 27	
Stationery and printing				12 87	
Fuel and light				10 85	
Postage				21 39	
Office rent				427 68	
Telephone and telegraph				44 57	
Miscellaneous				796 94	
					1,322 57
Total					$25,808 71

Seneca Street Bridge, Utica.

Chapter 454, Laws of 1909.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Fred J. Wagner	First resident engineer	$250 00 per month	$50 00	$12 20	$62 20
John Bartholomew	Bridge designer	175 00 per month	208 37	12 30	220 67
A. G. Hayden	Bridge designer	175 00 per month	15 48		15 48
R. M. Wheeler	Bridge draftsman	110 00 per month	28 39		28 39
A. C. Miller	Bridge draftsman	100 00 per month	174 20		174 20
J. A. Jensen	Mechanical draftsman	75 00 per month	10 71		10 71
Chas. Messina	Tracer	60 00 per month	13 55		13 55
L. D. Brownell	Assistant engineer	6 00 per day	888 00	16 40	904 40
E. M. Ellis	Assistant engineer	6 00 per day	18 00	5 46	23 46
Carl F. Hopstein	Draftsman	5 00 per day	10 00	4 43	14 43
S. M. Stuart	Inspector	5 00 per day	30 00	17 84	47 84
L. W. Moulton	Laborer	2 00 per day	4 00		4 00
			$1,450 70	$68 63	$1,519 33
	Incidental Expenses.				
Stationery and printing				$75 60	
Postage				90	
Telephone and telegraph				3 95	
Miscellaneous				84 87	
					165 32
Total					$1,684 65

Franklin Street Bridge, Syracuse.

Chapter 453, Laws of 1909.

NAME	Rank.	Rate of compensation.	Services.	Travel.	Total.
A. G. Hayden	Bridge designer	$175 00 per month	$891 34	....	$891 34
E. J. Carney	Bridge designer	150 00 per month	113 55	....	113 55
C. H. Wood	Bridge designer	150 00 per month	381 61	....	381 61
I. S. Abrahams	Bridge draftsman	125 00 per month	211 84	....	211 84
J. M. Angus	Bridge draftsman	125 00 per month	179 17	....	179 17
Geo. E. Maynard	Bridge draftsman	125 00 per month	183 33	....	183 33
Chas. E. Quimby	Junior bridge draftsman	75 00 per month	218 87	....	218 87
F. E. Blake	Mechanical engineer	175 00 per month	33 87	....	33 87
J. A. Jensen	Mechanical draftsman	75 00 per month	232 26	....	232 26
Chas. P. Wiweke	Mechanical draftsman	90 00 per month	67 74	....	67 74
Chas. Messina	Tracer	60 00 per month	132 03	....	132 03
J. J. Ryan	Tracer	50 00 per month	37 52	....	37 52
Total	....	....	$2,683 13	....	$2,683 13

Washington Street Bridge, Rome.

Chapter 522, Laws of 1910.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
L. D. Brownell	Assistant engineer	$6 00 per day	$24 00	$13 76	$37 76
J. Cyrus Podmore	Bridge designer	140 00 per month	20 00	....	20 00
James Dugan	Junior bridge designer	100 00 per month	16 68	....	16 68
L. W. Moulton	Laborer	2 00 per day	8 00	....	8 00
			$68 68	$13 76	$82 44
	Incidental Expenses.				
Miscellaneous				$0 58	58
Total					$83 02

Surveys for State Court of Claims.

Chapter 578, Laws of 1907; chapter 466, Laws of 1908; chapter 433, Laws of 1909.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
D. E. Whitford	Assistant engineer	$6 00 per day	$768 00	....	$768 00
L. D. Brownell	Assistant engineer	6 00 per day	216 00	$65 80	281 80
E. M. Ellis	Assistant engineer	6 00 per day	18 00	1 35	19 35
H. A. Gehring	Assistant engineer	5 50 per day	148 50	....	148 50
N. R. McLoud	Leveler	5 00 per day	175 00	158 73	333 73
F. A. Gordon	Rodman	4 00 per day	140 00	....	140 00
C. F. Hopstein	Draftsman	5 00 per day	15 00	....	15 00
James Keating	Laborer	2 00 per day	84 00	....	84 00
T. J. Aldcorn	Laborer	2 00 per day	70 00	....	70 00
L. W. Moulton	Laborer	2 00 per day	46 00	....	46 00
			$1,680 50	$225 88	$1,906 38
	Incidental Expenses.				
Livery				$116 00	
Postage				40	
Telephone and telegraph				75	
Miscellaneous				9 67	126 82
Total					$2,033 20

Cayuga and Seenca Canal Survey.

Chapter 433, Laws of 1909.

NAME.	Rank.	Rate of compensation.	Services	Travel.	Total.
Guy Moulton	Division engineer	$350 00 per month	$100 00	....	$100 00
James Burden	Resident engineer	225 00 per month	154 84	$2 80	157 64
L. S. Hulburd	Assistant engineer	6 00 per day	630 00	1,021 39	1,651 39
J. H. Sturdevant	Assistant engineer	6 00 per day	216 00	....	216 00
Harry C. Smith	Assistant engineer	5 50 per day	308 00	....	308 00
B. I. Hall	Assistant engineer	5 00 per day	525 00	....	525 00
F. D. Porter	Assistant engineer	5 00 per day	65 00	....	65 00
G. G. Underhill	Assistant engineer	5 00 per day	25 00	....	25 00
E. A. Duschak	Leveler	4 50 per day	472 50	....	472 50
W. S. Saxton	Leveler	4 50 per day	270 00	....	270 00
R. G. Pratt	Rodman	4 00 per day	276 50	10 30	286 80
J. M. Prior	Rodman	3 50 per day	276 50	5 30	281 80
H. J. Stabile	Rodman	3 50 per day	367 50	....	367 50
C. H. Hurley	Rodman	3 50 per day	276 50	10 30	286 80
H. R. Leland	Rodman	3 50 per day	150 50	9 54	160 04
J. C. Cookingham	Rodman	3 50 per day	269 50	....	269 50
C. H. Adams	Chainman	3 00 per day	237 00	9 75	246 75
G. E. Schaefer	Chainman	2 50 per day	272 50	....	272 50
J. C. Sophian	Chainman	2 50 per day	197 50	5 60	203 10
G. A. Payne	Chainman	2 50 per day	245 00	6 05	251 05
K. Moulton	Chainman	2 50 per day	197 50	7 30	204 80
H. J. Spelman	Chainman	2 50 per day	262 50	....	262 50
H. Kramer	Foreman of borings	4 50 per day	472 50	20 90	493 40
H. W. Stoneburg	Foreman of borings	4 00 per day	420 00	30	420 30
J. J. Breuckel	Axeman	2 00 per day	210 00	74 16	284 16
L. E. Moyer	Laborer	2 00 per day	210 00	....	210 00
F. W. Pettet	Laborer	2 00 per day	52 00	....	52 00
Henry Ivison	Laborer	2 00 per day	58 00	....	58 00
H. D Caldwell	Laborer	2 00 per day	210 00	....	210 00
L. F. French	Laborer	2 00 per day	210 00	....	210 00
M. H. McConnell	Laborer	2 00 per day	210 00	....	210 00
Clarence Phelps	Laborer	2 00 per day	172 00	....	172 00
C. W. Avery	Laborer	2 00 per day	88 00	....	88 00
H. W. Sullivan	Laborer	2 00 per day	172 00	....	172 00
A. H. Coleman	Laborer	2 00 per day	172 00	....	172 00
Thos. Welch	Laborer	2 00 per day	208 00	....	208 00
J. A. Smith	Laborer	2 00 per day	210 00	....	210 00
U. C. Zeluff	Laborer	2 00 per day	210 00	....	210 00
John Coleman	Laborer	2 00 per day	158 00	....	158 00
Geo. Jardine	Laborer	2 00 per day	86 00	....	86 00
Eugene Burns	Laborer	2 00 per day	16 00	....	16 00
Geo. Thorpe	Laborer	2 00 per day	208 00	....	208 00
G. C. Curtis	Laborer	2 00 per day	192 00	....	192 00
Clair Emens	Laborer	2 00 per day	16 00	....	16 00
J. H. McCabe	Laborer	2 00 per day	146 00	....	146 00
O. M. Punch	Laborer	2 00 per day	78 00	....	78 00
J. Madigan	Laborer	2 00 per day	54 00	....	54 00
L. V. Dunham	Laborer	2 00 per day	76 00	....	76 00
Geo. W. Graves	Laborer	2 00 per day	78 00	....	78 00
Chas. Boak	Laborer	2 00 per day	74 00	....	74 00
Wm. Marshall	Laborer	2 00 per day	114 00	....	114 00
Steve Childs	Laborer	2 00 per day	114 00	....	114 00
Claude Facer	Laborer	2 00 per day	102 00	....	102 00
E. A. Brooks	Laborer	2 00 per day	104 00	....	104 00
Jos. McDermott	Laborer	2 00 per day	118 00	....	118 00
Wm. Childs	Laborer	2 00 per day	108 00	....	108 00
C. Krumo	Laborer	2 00 per day	42 00	....	42 00
			$10,963 84	$1,183 69	$12,147 53

Incidental Expenses.

Instruments and tools	$2 06	
Stationery and printing	8 38	
Fuel and light	9 97	
Postage	9 39	
Office rent	151 92	
Telephone and telegraph	22 91	
Miscellaneous	1,481 20	
		1,685 83
Total		$13,833 36

SUMMARY.

The foregoing tables are summarized as follows:

Ordinary Repairs to Canals.

1.	Erie canal, chapter 432, Laws of 1909	$8,871 70
2.	Black River canal, chapter 432, Laws of 1909	68 40
3.	Cayuga and Seneca canal, chapter 432, Laws of 1909	59 90

Construction of the Barge Canal.

4.	Erie canal, chapter 147, Laws of 1903; chapter 195, Laws of 1909	105,938 79
5.	Oswego canal, chapter 147, Laws of 1903; chapter 195, Laws of 1909	45,475 47
6.	Cayuga and Seneca canal, chapter 391, Laws of 1909	25,808 71

Special Work.

7.	Construction of Seneca street bridge, Utica, chapter 454, Laws of 1909	1,684 65
8.	Construction of Franklin street bridge, Syracuse, chapter 453, Laws of 1909	2,683 13
9.	Construction of Washington street bridge, Rome, chapter 522, Laws of 1910	83 02

Special Surveys.

10.	Surveys for State Court of Claims, chapter 578, Laws of 1907; chapter 466, Laws of 1908; chapter 433, Laws of 1909	2,033 20
11.	Survey for Cayuga and Seneca canal, chapter 433, Laws of 1909	13,833 36
	Total	$206,540 33

TABLE OF CONTRACTS COMPLETED ON THE MIDDLE DIVISION DURING THE FISCAL YEAR ENDED SEPTEMBER 30, 1910.

CONTRACTOR.	Date of contract.	Character of work.	ACT.		Appropriation.	Engineer's preliminary estimate.	Contract price.	Final payment.
			Chap.	Year.				
National Construction Co....	Nov. 1, 1906	Constructing stairways for lift bridge at Catherine street, Syracuse..........	683	1906	$1,500 00	$1,065 50	$1,500 00	$1,500 00

Construction of Barge Canal.

Chapter 147, Laws of 1903, and amendatory laws.

CONTRACTOR.	Date of contract.	Character of work.	Engineer's preliminary estimate.	Contract price, as affected by alterations.	Final payment.
Groton Bridge Co................	Aug. 10, 1906	Contract No. 7, Erie canal — Bridges on Contracts Nos. 4 and 5..	$39,883 30	$42,989 90	$41,796 83

TABLE OF CONTRACTS PENDING ON THE MIDDLE DIVISION, SEPTEMBER 30, 1910.

CONTRACTOR.	Date of contract.	Character of work.	ACT.		Engineer's preliminary estimate.	Contract price, as affected by alterations.	Payments to September 30, 1910.
			Chap.	Year.			
N. D. Peters Co.	Nov. 19, 1909	Seneca street bridge, Utica	454	1909	$19,000 00	$19,571 25	$15,318 00
Cunningham-Woodard Co.	....	Raising highway at Contract No. 78, near Fulton	......	......	11,627 50	11,627 50	310 00

Construction of Barge Canal.

Chapter 147, Laws of 1903, and amendatory laws.

CONTRACTOR.	Date of contract.	Character of work.	Engineer's preliminary estimate.	Contract price, as affected by alterations.	Payments to September 30, 1910.
Empire Engineering Corporation	April 18, 1905	Contract No. 4, Erie canal — The 4½ miles east of Oneida lake	$812,560 00	$726,779 64	$687,380 00
Empire Engineering Corporation	April 18, 1905	Contract No. 5, Erie canal — Mosquito Point to Fox Ridge	421,252 00	375,871 07	125,820 00
McDermott Contracting Co.	June 7, 1906	Contract No. 10, Oswego canal — Through Fulton	1,149,988 00	1,111,964 57	606,800 00
James Stewart & Co.	Sept. 23, 1907	Contract No. 12, Erie canal —Oneida lake to Mosquito Point	3,087,060 00	3,514,819 16	1,230,140 00
Penn Bridge Co.	Nov. 7, 1908	Contract No. 13, Erie canal — Bridges on part of Contract No. 12	17,471 50	17,955 30	7,330 00
M. Fitzgerald	Sept. 24, 1910	Contract No. 22, Erie canal — Bridges on part of Contract No. 12	107,126 00	110,268 00	0
Penn Bridge Co.	Jan. 7, 1910	Contract No. 33, Oswego canal — Lock-gates, etc., on Contract No. 10	46,463 24	50,386 89	0
Gilmour-Horton-Allen Co.	Sept. 16, 1907	Contract No. 35, Oswego canal — Through Oswego	752,760 00	714,027 45	303,490 00
James Stewart & Co.	April 15, 1910	Contract No. 39, Oswego canal — Dredging Oswego river, etc., Three River Point to Fulton	972,900 00	1,048,674 40	26,430 00
Shanley-Morrissey, Inc.	July 9, 1909	Contract No. 42, Erie canal — Herkimer-Oneida county line to Oriskany road	1,312,814 00	1,201,048 50	229,480 00
M. A. Talbot Co.	Oct. 15, 1909	Contract No. 43, Erie canal — Oriskany road to Mud creek	1,529,885 00	1,335,998 10	0
Scott Brothers	Jan. 8, 1910	Contract No. 44, Erie canal — Mud creek to Contract No. 4	1,926,093 00	1,748,679 00	109,760 00

Scott Brothers	May 6, 1908	Contract No. 45, Erie canal — Through Baldwinsville; Caughdenoy dam	425,124 00	472,802 35	420,460 00
Kinser Construction Co	Nov. 23, 1908	Contract No. 46, Erie canal — Fox Ridge to Galen town line	1,367,583 00	1,216,138 10	356,510 00
Buffalo Dredging Co	Sept. 23, 1910	Contract No. 50, Erie canal — Dam, waste-gates and spillway at Hinckley	1,076,000 00	963,415 00	0
Scott Brothers	Aug. 16, 1909	Contract No. 53, Oswego canal — Through Phoenix	200,500 00	167,385 00	137,530 00
Arthur McMullen	Oct. 19, 1908	Contract No. 55, Erie canal — Delta reservoir	1,014,525 00	929,836 00	579,410 00
Cunningham-Woodard Co	Aug. 18, 1910	Contract No. 78, Oswego canal — Dike along Oswego river near Fulton	55,154 00	49,025 95	23,560 00
Lupfer & Remick	Sept. 23, 1910	Contract No. 79, Oswego canal — Bridge Street bridge at Oswego	39,735 00	37,480 00	70 00
D'Olier Engineering Co	April 6, 1910	Contract No. 90, Erie and Oswego canals — Power supply, lock No. 24 at Baldwinsville and lock No. 8 at Oswego	86,536 35	86,339 35	760 00

EXTRA AND UNSPECIFIED WORK ORDERS PAID TO SEPTEMBER 30, 1910.

CONTRACT.	Date of order.	Amount.	Total.
4	April 24, 1907	$1,257 29	
4	May 30, 1909	281 34	
4	June 4, 1909	399 22	
4	Aug. 30, 1909	7,635 64	
4	Nov. 18, 1909	62 65	
4	May 24, 1910	2,948 31	$12,584 45
7	May 10, 1909	$3,143 17	3,143 17
12	Jan. 23, 1909	$328 51	328 51
35	Oct. 2, 1908	$760 95	760 95
45	Dec. 15, 1908	$68 71	
45	Aug. 5, 1909	480 20	
45	Oct. 29, 1909	317 97	866 88
Total			$17,683 96

REPORT

OF THE

DIVISION ENGINEER

OF THE

WESTERN DIVISION

For the Fiscal Year Ended September 30, 1910

WESTERN DIVISION.

STATE OF NEW YORK,
DEPARTMENT OF STATE ENGINEER AND SURVEYOR,
WESTERN DIVISION.
ROCHESTER, N. Y., *October* 1, 1910.

Hon. FRANK M. WILLIAMS, *State Engineer and Surveyor, Albany, N. Y.:*

Sir.— I have the honor of submitting herewith my annual report as Division Engineer of the Western Division, for the fiscal year ended September 30, 1910.

The Western Division comprises that part of the existing canal system of the state extending from the east line of Wayne county to the westerly line of Main street, in the city of Buffalo, covering a total of 147.88 miles of navigable waters. For Barge canal construction the division limits are substantially the same, but construction work terminates at the Niagara river at Tonawanda.

The principal work of this division has consisted in performing the necessary engineering work in connection with the existing Erie canal, making surveys, plans and estimates and supervising the construction of the Barge canal under chapter 147, Laws of 1903, and amendments thereto.

Coöperation has been extended and assistance given to the Department of Public Works in making surveys, plans and estimates, and also appropriation maps, when required.

It is a pleasure to announce that notwithstanding the large amount of work done in enlarging the present canal between Rochester and Lockport, navigation has been carried on without interruption, and no leaks or breaks have occurred.

Credit is due to the Department of Public Works and also to the contractors and engineers of this Department, for their able coöperation to secure the safety of the canal embankment and structures.

Surveys and maps have been made and testimony given on behalf of the State in the Court of Claims and in suits brought against the State for damages resulting from seepage, leaks and breaks in the canal.

The lift bridge at Allen street, Rochester, has been completed, leaving only one contract pending, namely, the Georgia street bridge, in the city of Buffalo.

The details of contracts completed and in force are herewith appended.

CONTRACTS COMPLETED DURING THE FISCAL YEAR ENDED SEPTEMBER 30, 1910.

ALLEN STREET BRIDGE, ROCHESTER.

(Chapter 291, Laws 1908.)

Contract dated, January 15, 1909.
Contract to be completed, June 1, 1909.
Contractor, Wm. T. McKibben Co., New York city.

Total appropriation	$50,000 00
Engineer's estimate	35,503 00
Contract price	26,708 40
Final estimate	24,481 48

This is a bascule bridge, constructed over the existing Erie canal at Allen street, in the city of Rochester. The plans for this bridge were adopted by the Canal Board October 21, 1908, and called for the construction of a lift bridge, with plate girders 69 feet ¾ inch long and having a clear roadway 36 feet wide and plank sidewalks 8 feet wide, with a clear span between abutments of 48 feet.

Owing to the fact that this contract was not let at the first letting, but had to be reädvertised, the erection of steel was delayed until after the opening of navigation. The bridge was erected with the west end supported on bents in the canal prism, elevating the girders sufficiently to provide clearance for boats. The reinforced counterweights are attached to the cantilever ends of the main girders and operated in the concrete pit below the street level at the east end of the bridge, leaving the street surface clear of all obstructions.

The pavement on the bridge is of maple slabs, treated with a wood preservative. The bridge is operated by two 25-horse-power, direct current motors, which, with the machinery, are placed on the counterweight, moving with it.

A new foot bridge, built of plate girders with concrete stairs and floor, was erected just south of Main street.

Work was begun on January 18, 1909, but, owing to delays in getting the structural steel and machinery, was not completed until December 4, 1909.

The bridge is similar in design to the one at Lyell avenue, in the city of Rochester. The designs were prepared by Mr. Wm. R. Davis, Chief Bridge Designer. The operation of the bridge is in all respects satisfactory.

CONTRACTS PENDING SEPTEMBER 30, 1910.

GEORGIA STREET BRIDGE, BUFFALO.

(Chapter 452, Laws 1909.)

Contract dated, January 29, 1910.
Contract to be completed, July 1, 1910.
Contractors, Lupfer & Remick, Buffalo, N. Y.

Total appropriation	$19,500 00
Engineer's estimate	17,268 00
Contract price	18,121 00
Payments to September 30, 1910	14,274 00

This is a fixed bridge, constructed over the existing Erie canal at Georgia street, in the city of Buffalo. The plans were adopted by the Canal Board October 27, 1909, for an overhead steel bridge (Pratt truss), having a length of 177 ft. 2¾ in., center to center of end pins, a total roadway of 179 ft. 3⅝ in. and a total length of pavement of 181 ft. 2⅝ in., with a clear width of roadway 18 ft. 10 in. There are no sidewalks on the bridge. The floor beams were fabricated with a view of attaching sidewalks in the future.

The bridge floor is composed of nailing strips with 4-inch creosoted planking, surfaced with 3½-inch creosoted wood block pavement, making a total thickness of floor of 7½ inches.

The bridge is supported at the west end by the original stone masonry abutment, taken down to a certain elevation, then reinforced on the face and capped with second-class concrete. The east end is supported by a new concrete abutment built on the old pile foundation, reinforced with 41 new piles.

Work was commenced about February 1, 1910, but, owing to a strike of the laborers during the construction of the substructure and also to delay in connection with the superstructure, the work was not completed within the time limit set forth in the contract.

BARGE CANAL.

(Chapter 147, Laws 1903.)

For the purpose of carrying on the Barge canal work, the Western Division is divided into the following residencies:

Erie Canal Residency No. 8. From the easterly line of Wayne county, at the southeast corner of the town of Galen, to the westerly line of Wayne county, one-half mile west of the village of Wayneport, Wayne county. B. E. Failing, Resident Engineer, in charge, with office at Lyons.

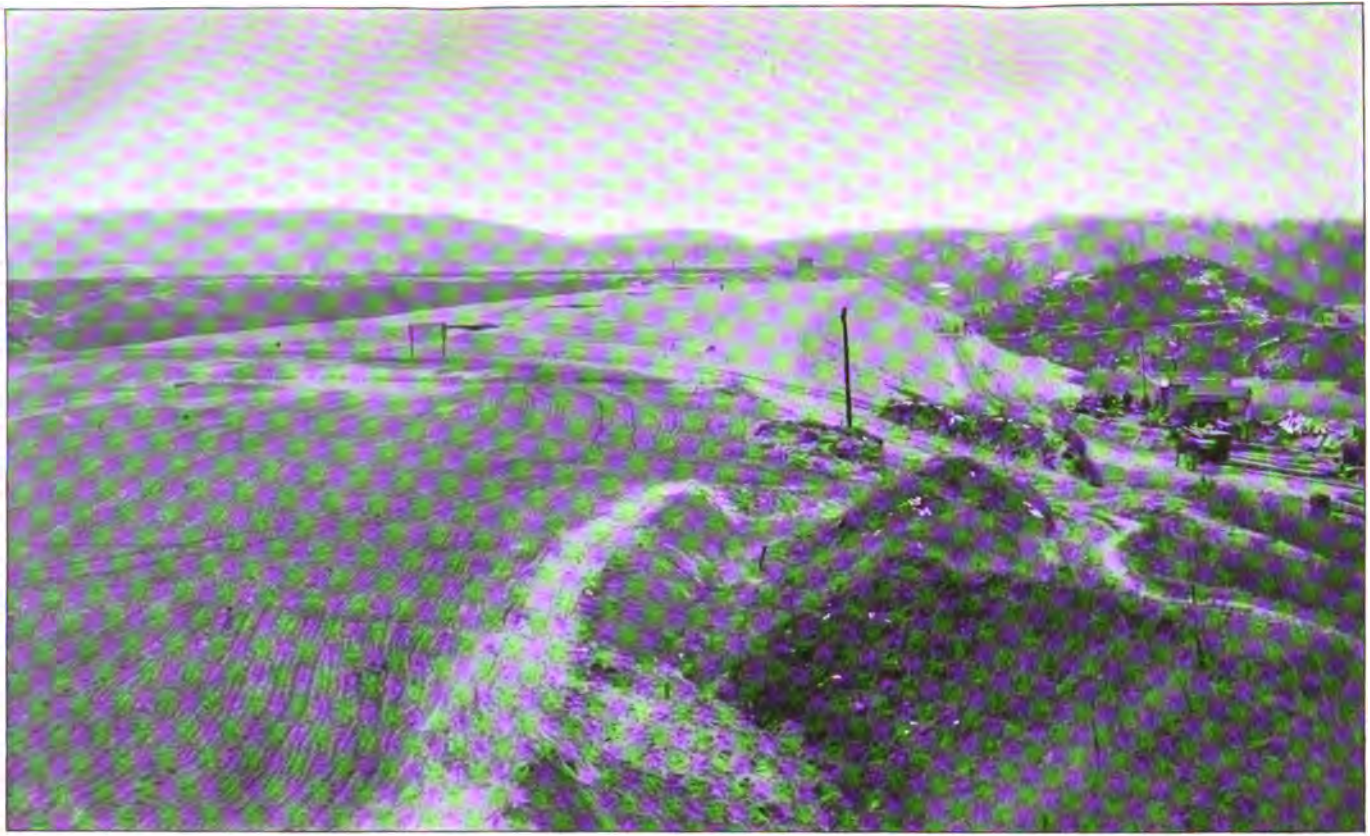
Erie Canal Residency No. 9-A. From the westerly line of Wayne county to the Genesee river, following the route of the present Erie canal to King's Bend, near Pittsford, and thence by a land line to the Genesee river. O. F. Bellows, Resident Engineer, in charge, with office at Rochester.

Erie Canal Residency No. 9-B. By way of a land line from the Genesee river, south of Rochester, to South Greece, thence along the present Erie canal to the westerly line of Monroe county, about 3 miles west of the village of Brockport. Thomas J. Morrison, Resident Engineer, in charge, with office at Rochester.

Erie Canal Residency No. 10-A. From the westerly line of Monroe county to a point 100 feet east of Gasport bridge, in the village of Gasport, Niagara county. Chas. A. Ingersoll, Resident Engineer, in charge, with office at Medina.

Erie Canal Residency No. 10-B. From a point 100 feet east of Gasport bridge to the head of the present guard-lock, near the village of Pendleton, Niagara county.

Erie Canal Residency No. 11. From the head of the guard-lock near the village of Pendleton, Niagara county, to the Niagara



Barge Canal. Contract No. 41.

Completed embankment at Irondequoit creek crossing — built by steam-shovel, dump-cars and water-jets.

river at Tonawanda, to and through the city of Buffalo, Erie county. C. J. McDonough, Resident Engineer, in charge of residencies 10-B and 11, with office at North Tonawanda. Mr. McDonough had charge of these residencies as First Assistant Engineer up to April 1, 1910, at which time he was promoted to the rank of Resident Engineer.

During the past year progress on Barge canal construction has been extremely satisfactory. The average rate of progress on contracts in force is about 25 per cent per year, with a few exceptions. The average monthly earnings on contracts for the past year have been more than one-third of a million dollars per month, or at a rate of between four and five million dollars worth of work per year.

At the present rate of progress, it is confidently expected that the Barge canal will be entirely completed, from the Genesee rivre, in Rochester, to the Niagara river at Tonawanda, in about two years, with the possible exception of two large locks at Lockport. East of Rochester the work has not been so well advanced, owing to delays in settling on the routes through Wayne county and consequent delays in the awarding of contracts.

At the present time contracts Nos. 38 and 7 have been completed and the final estimates are now being prepared for contracts Nos. 6, 9 and 41, which contracts will be completed about January 1, 1911. In addition to this, several contracts will be completed during the coming year.

Contracts Nos. 49, 63, 21, 62 and 67 have been awarded during the past year. Excellent progress has been made on all of these contracts.

The reports of the several Resident Engineers, giving in detail the work done during the fiscal year ended September 30, 1910, on their respective residencies, follow:

ERIE CANAL, RESIDENCY NO. 8.

Resident Engineer B. E. Failing reports:

" This residency embraces the entire length of the Barge canal through Wayne county and extends from the easterly line of the county, at the southeastern corner of the town of Galen, to the westerly line, one-half mile west of the village of Wayneport, Wayne county.

"The preliminary work, so-called, was practically completed last year.

"This residency embraces four contracts, namely, Nos. 47, 48, 77 and 49.

"*Contract No. 47.* This contract extends from the southeast corner of the town of Galen to a point near the New York Central & Hudson River railroad crossing at Lyons; length 14.46 miles. Crowell-Sherman-Stalter Company are the contractors for this work. D. E. Bellows, Assistant Engineer, has charge of same. Good progress has been made during the year.

"The hydraulic dredge *Clyde* has worked between Sta. 5731 and Sta. 6316 and completed about 5.9 miles of canal, removing 1,858,000 cu. yds. of pay material. This amount is the record of total excavation for the year for any one contract on the whole line of canal.

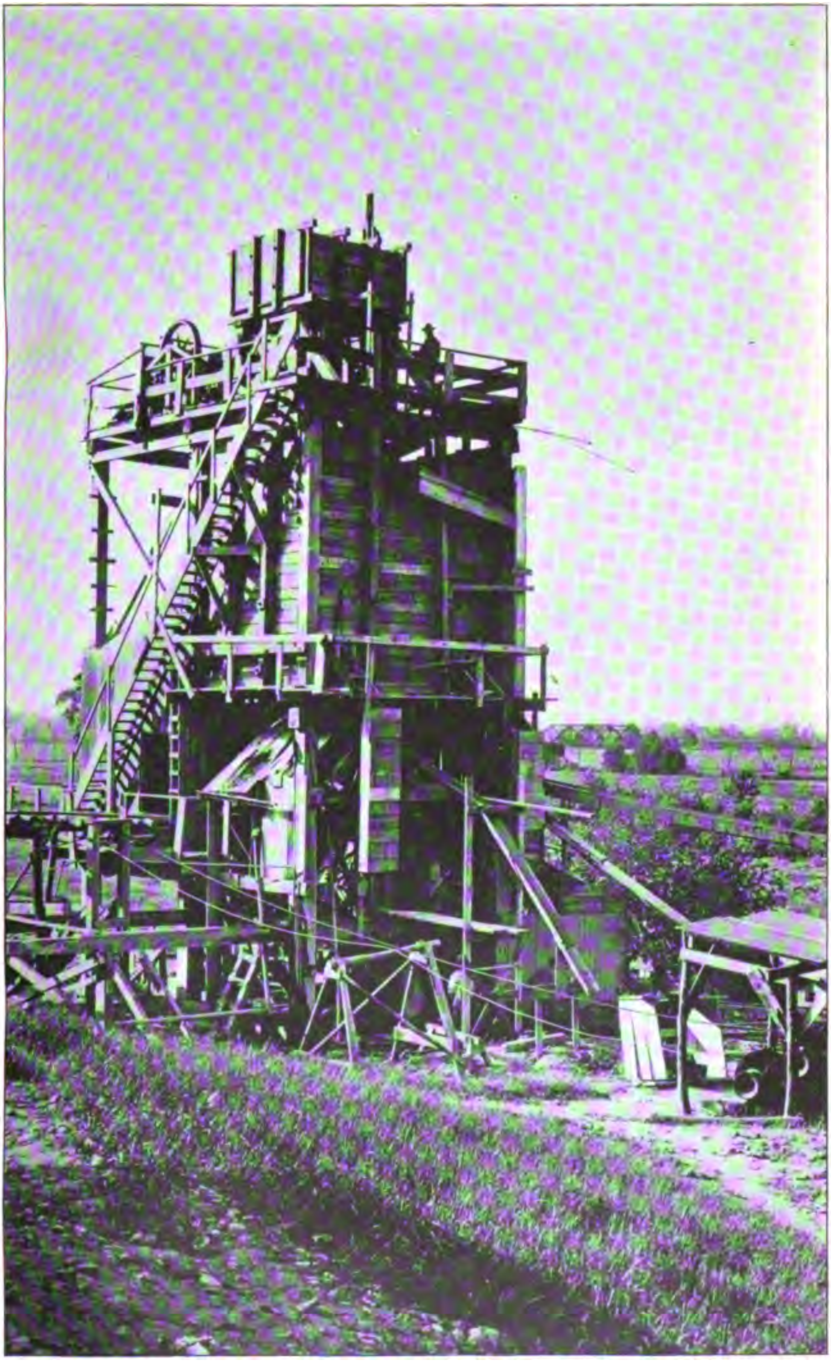
"Work was suspended in the winter of 1909–1910, from December 17 to March 20. The dredge stopped work at Sta. 6293-85 on the morning of August 21, to await the completion of the temporary bridge at the West Shore railroad, and resumed operations on September 7. In all, the dredge worked 235 days, of three 8-hour shifts each, during the year, and averaged 7,900 cu. yds. per working day for the season, and it has removed as high as 24,000 cu. yds. in 24 hours.

"The front dikes on the spoil area were built by a Browning excavator, which handled a 1½-yard scraper bucket. The majority of the back dikes were made of planks, which lessened the cost and proved entirely satisfactory.

"At lock No. 26 the progress of the work was not in keeping with the pace set by the remainder of the work on the contract, although it will probably be finished within the time limit, which is May 12, 1912. The excavation is being done by a Dobbie excavator, operating a 1½-yard scraper bucket. The sand and gravel used in the concrete are washed and screened and are secured within 1,000 feet of the lock. The upper approach and the west wall of the lock are finished.

"Creager's bridge is completed, except approaches.

"The stream entrance at Black creek is completed.



BARGE CANAL, CONTRACT NO. 47.
Gravel-washing and concrete-mixing plant.

"The following is a table showing the percentage of work done during the year and to date on the contract:

ITEMS OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing............................acres	225	216	250	96 0	111.1
Grubbing..........................cu. yds.	890	554	554	62.3	62.3
Excavation.......................cu. yds.	5,310,800	1,888,048	2,463,485	35.5	46.4
Sheeting and bracing..........M. ft. B. M.	25	28	28	112.0	112.0
Embankment.......................cu. yds.	32,800	4,130	4,130	12.6	12.6
Lining..............................cu. yds.	1,120	0	0	0	0
Sawed lumber, pine or fir......M. ft. B. M.	4	2½	2½	62.5	62.5
White oak in miter-sills........M. ft. B. M.	7	0	0	0	0
Sawed lumber, white oak......M. ft. B. M.	1	0	0	0	0
Round timber in cribs..............lin. ft.	320	0	0	0	0
Stone filling in cribs...............cu. yds.	410	0	0	0	0
Foundation piles...................lin. ft.	4,500	3,772	3,815	83.8	83 8
Mooring piles.........................No.	8	0	0	0	0
Wooden sheet-piling...........M. ft. B. M.	7	5	5	71.4	71.4
Second-class concrete..............cu. yds.	23,920	6,994	6,994	29.2	29.2
Reinforced concrete.............cu. yds.	113	107	107	94.7	94.7
First-class masonry bridge coping...cu. yds.	2	1	1	50.0	50.0
Second-class stone paving......... sq. yds.	50	36	36	72.0	72.0
15-in vitrified pipe, laid............lin. ft.	865	0	786	0	91.1
Trench and backfill.................lin. ft.	865	0	786	0	91.1
Structural steel.......................lbs.	158,100	139,491	139,491	88.2	88 2
Metal reinforcement..................lbs.	24,500	11,438	11,438	46.6	46.6
Wrought iron.........................lbs.	2,425	352	352	1.4	1.4
Steel castings.........................lbs.	10,400	0	0	0	0
Iron castings, plain..................lbs.	6,290	0	0	0	0
Iron castings, machined...............lbs.	6,600	1,590	1,590	24.1	24.1
Wooden pavement................sq. yds.	330	275	275	83.6	83.6
Wooden fence.......................lin. ft.	925	0	0	0	0
Wrought iron pipe railing...........lin. ft.	470	0	0	0	0
Sawed lumber in needles......M. ft. B. M.	14	0	0	0	0
Metal in lock-valves..................lbs.	24,000	0	0	0	0
Metal in buffer-beams.................lbs.	90,000	324	324	0.4	0.4
Metal in lock-gates...................lbs.	180,000	0	0	0	0
Maintaining highway traffic......lump sum	$5,000	0	0	0	0
Coffer-dams, etc................lump sum	$16,000	$1,120	$1,120	7.0	7.0
Gross estimate.......................	$1,273,071 35	$435,150	$553,650	34.2	43.5

"*Contracts Nos.* 48 and 77 extend from Lyons to a point 500 feet east of Yellow Mills, Palmyra.

"The route for contract No. 48 through the village of Lyons is not settled upon. The village has served a protest upon the State Engineer against the adoption of the so-called 'South route' and the construction of the two contracts is being held up on that account.

"The preliminary work and plans on both contracts are 96 per cent completed. On contract No. 77 surveys are being made and about 70 per cent of the appropriation maps are finished.

"*Contract No.* 49. This contract, extending from a point about 500 feet east of Yellow Mills bridge to the Wayne-Monroe county line, a length of 6.18 miles, and including lock No. 30, sluice-gates, highway bridges, culverts, etc., was let February 21, 1910, to Bellew & Merritt Co., of Tuckahoe, N. Y. Mr. Howard N. Metzger is the engineer in charge.

"Appropriation surveys have been completed, with the exception of three parcels.

" Work was begun on March 24, 1910. In May the culvert under highway at lock No. 30 was completed. On May 30 a Marion steam-shovel and dump trains were put in operation at the lock. On July 25 the Marion shovel was replaced by a 70-ton Bucyrus, and up to date the shovels have removed 85,000 cubic yards. A Browning crane, operating a one-yard Page bucket, was installed in June and is being used at lock No. 30. It has removed to date 8,000 cubic yards. A mixer plant has been erected and is ready for operation.

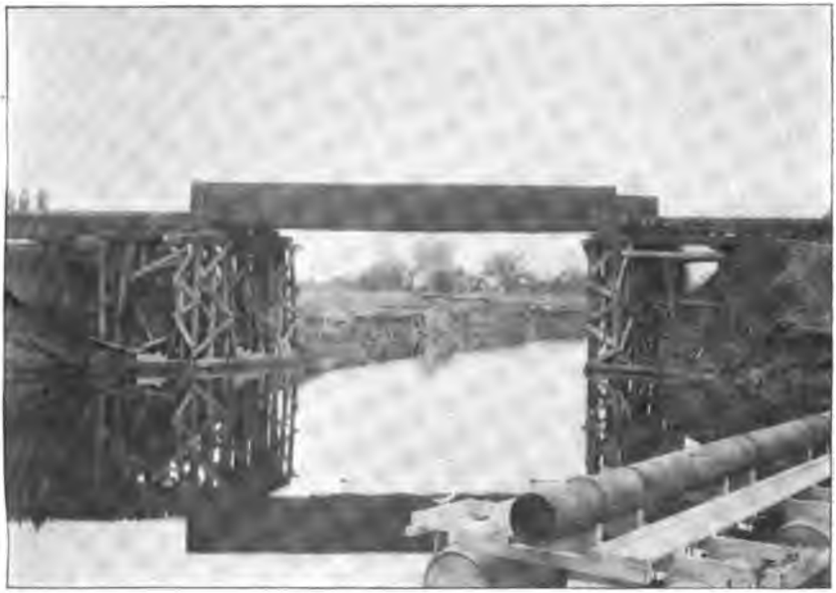
" East of the lock and at Sta. 7465, a McMyler hoist, operating a one-yard orange peel bucket, was installed. This machine worked east, digging a ditch along the line of the canal to the end of the contract. It has removed 21,000 yards.

"At Sta. 7470 a Lidgerwood excavator has been erected. It is one of the largest machines of this type ever erected. The boom is 100 feet long and handles a 2½-yard bucket. It was finished about the first of September and worked but a couple of days when the swinging engine was broken and it is under repairs at the present writing.

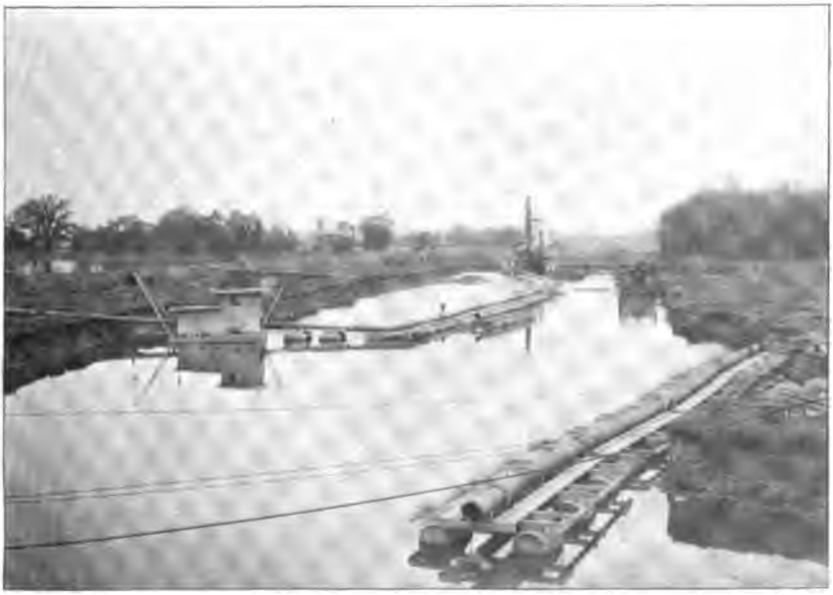
" The contractors' plant is valued at about $75,000.

" The following is a table showing the percentage of work done to date on this contract:

ITEMS OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing .... acres	220	117	117	53.2	53.2
Excavation .... cu. yds.	1,543,600	114,674	114,674	7.4	7.4
Second-class concrete .... cu. yds.	31,250	23	23	0	0
Reinforced concrete .... cu. yds.	250	36	36	10.4	10.4
Metal reinforcement .... lbs.	28,400	1,335	1,335	4.5	4.5
Maintaining highway traffic ...... lump sum	$2,000	$100	$100	5 0	5.0
Gross estimate	$750,688 75	$30,470	$30,470	4 1	4.1



BARGE CANAL, CONTRACT NO. 47.
Temporary bridge for maintaining traffic on the West Shore railroad while cutting through the existing embankment.



BARGE CANAL, CONTRACT NO. 47.
View showing hydraulic dredge *Clyde* operating west of cut through West Shore railroad embankment.

ERIE CANAL, RESIDENCY NO. 9-A.

Resident Engineer O. F. Bellows reports:

"Residency No. 9-A extends from the Wayne-Monroe county line to the Genesee river, a distance of about 18 miles, and includes contracts Nos. 63, 38, 41 and 23.

"*Preliminary Work.*

"On contract No. 63 the running of the off-set center line was completed and appropriation surveys begun and pushed as rapidly as circumstances would permit. About 95 per cent of the appropriation surveys have been made and about 60 per cent of the entire right of way has been appropriated.

"*Construction Work.*

"All the contracts within this residency are under construction or completed.

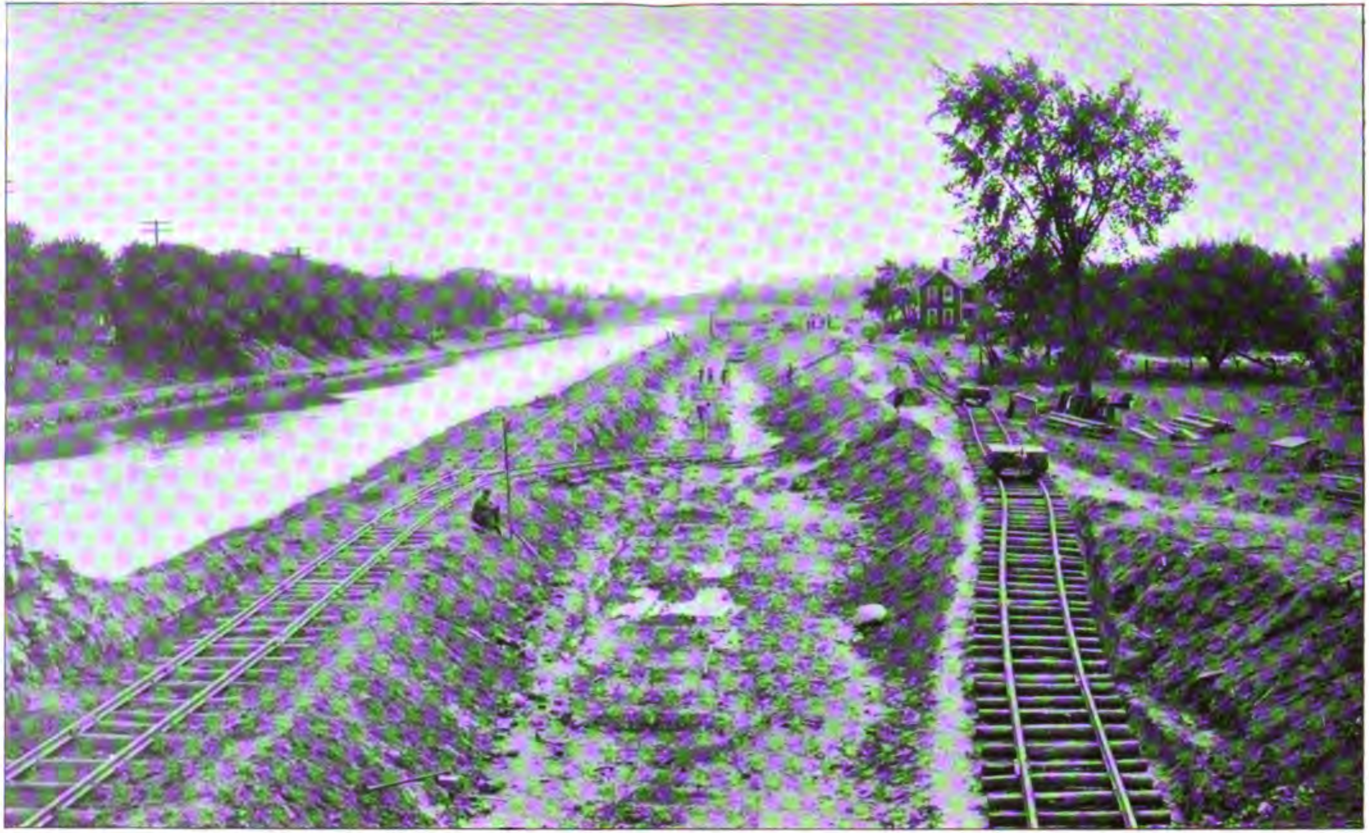
"*Contract No.* 63. This contract provides for the improvement of the Erie canal, from the west line of Wayne county to the east end of contract No. 23 at King's Bend, a distance of 12.22 miles. H. S. Kerbaugh, Incorporated, of Philadelphia, Pa., contractors. G. M. Briggs, Assistant Engineer, has been in charge of the Fairport section, extending to Bushnell's Basin, and F. T. Marsh and E. P. Strowger, Assistant Engineers, have been in charge at different times of the Pittsford section.

"The eastern part of this contract is primarily a dredging proposition, the material to be excavated in the widening of the existing canal being of a light sandy nature. To this end a Lidgerwood excavator, with 1½-yard bucket and 70-foot boom, has been put in operation at the eastern end of the contract, excavating in the prism sufficient material to form dikes for the retention of the material to be pumped into the spoil area during the coming navigable season. It is the intention of the contractors to install a hydraulic dredge early in the season of 1911; this dredge is to have a 20-inch suction pipe and be operated by electric power from Niagara Falls.

"At the Pittsford section, where considerable shale rock occurs, the excavation is being done with a 70-ton Bucyrus steam-shovel, 18-ton Porter locomotives and 4-yard dump cars, the material being spoiled in banks that require a maximum haul of about 1¼ miles. Actual work with the steam-shovel plant began on August 31, and in drainage ditches, with teams and scrapers, on August 24.

" The following table gives the amount of work to be done and the work done to September 30, 1910:

ITEMS OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Coffer-dams, pumping, etc. . . . miles	$12.22	0	0	0	0
Clearing . . . lump sum	1,000	$305	$305	30.5	30.5
Excavation . . . cu. yds.	2,772,000	36,709	36,709	1.3	1.3
Sheeting and bracing . . . M. ft. B. M.	85	0	0	0	0
Round timber bracing . . . lin. ft.	500	0	0	0	0
Channeling . . . sq. ft.	20,000	0	0	0	0
Forming embankment . . . cu. yds.	330,000	5,312	5,312	1.6	1.6
Lining . . . cu. yds.	31,600	0	0	0	0
Puddle . . . cu. yds.	8,200	0	0	0	0
Sawed lumber, yellow pine or Douglas fir M. ft. B. M.	44	0	0	0	0
Creosoted lumber . . . M. ft. B. M.	22	0	0	0	0
Foundation piles . . . lin. ft.	19,600	0	0	0	0
Wooden sheet-piling . . . M. ft. B. M.	45	0	0	0	0
Second-class concrete . . . cu. yds.	51,700	0	0	0	0
Third-class concrete . . . cu. yds.	6,100	0	0	0	0
Reinforced concrete . . . cu. yds.	2,300	0	0	0	0
First-class masonry coping . . . cu. yds.	32	0	0	0	0
Wash wall . . . cu. yds.	74,600	0	0	0	0
First-class stone paving . . . sq. yds.	14	0	0	0	0
Second-class stone paving . . . sq. yds.	10,100	0	0	0	0
Third-class stone paving . . . sq. yds.	1,640	0	0	0	0
Cobblestone paving . . . sq. yds.	552	0	0	0	0
Second-class riprap . . . cu. yds.	400	0	0	0	0
Third-class riprap . . . cu. yds.	250	0	0	0	0
Fourth-class riprap . . . cu. yds.	9,540	0	0	0	0
Cast iron culvert pipe and specials . . . lbs.	1,063,000	8,600	28,600	2.7	2.7
Structural steel . . . lbs.	2,465,000	0	0	0	0
Metal reinforcement . . . lbs.	383,000	0	0	0	0
Iron castings, plain . . . lbs.	16,500	0	0	0	0
Expanded metal . . . lbs.	5,700	0	0	0	0
Cement sidewalks . . . sq. ft.	5,850	0	0	0	0
Relaving flag sidewalks . . . sq. yds.	45	0	0	0	0
Wooden pavement, 2½-in. thick . . . sq. yds.	1,760	0	0	0	0
Wooden pavement, 3½-in. thick . . . sq. yds.	2,012	0	0	0	0
Wood block pavement . . . sq. yds.	500	0	0	0	0
Wooden fence . . . lin. ft.	10,400	0	0	0	0
Wrought iron pipe railing . . . lin. ft.	1,030	0	0	0	0
Lattice railing . . . lin. ft.	1,600	0	0	0	0
Repointing old masonry . . . lin. ft.	16,000	0	0	0	0
Drilling bolt holes in old masonry . . . lin. ft.	100	0	0	0	0
Resetting pipe railing . . . lin. ft.	230	0	0	0	0
Sluice-gates, 36x36 in . . . each	3	0	0	0	0
Sluice-gates, 24x24 in . . . each	4	0	0	0	0
Sluice-gate, 24 in. diam . . . each	1	0	0	0	0
Sluice-gates, 42 in. diam . . . each	3	0	0	0	0
Metal in guard-gates . . . lbs.	465,000	0	0	0	0
Machinery for lift bridge . . . lbs.	52,000	0	0	0	0
Electrical equipment . . . each	1	0	0	0	0
Operator's cabin . . . each	1	0	0	0	0
Pump . . . each	1	0	0	0	0
Tar felt waterproofing . . . sq. ft.	274,000	0	0	0	0
Removing old bridge superstructures . . lump sum	$2,500	0	0	0	0
Maintaining navigation . . . lump sum	$12,000	0	0	0	0
Maintaining highway traffic . . . lump sum	$8,000	$500	$500	6.2	6.2
Gross estimate . . .	$1,990,043	$14,500	$14,500	0.73	0.73



Barge Canal, Contract No. 63.

View showing progress in widening canal near Pittsford by steam-shovel excavation during navigation season.

"*Contract No.* 38. This contract provided for the construction of the superstructure, substructure and approaches for a highway bridge at Wappings, 2.5 miles west Fairport.

"As noted in the last annual report, contract No. 38 was completed in August, 1909. The contractors were Henry Tosh & Son of Port Byron, N. Y. Contract price was $17,157.50, and the final estimate, including Alteration No. 1, was $16,286.67.

"Mr. H. R. Wickham was the Assistant Engineer in charge of this contract.

"*Contract No.* 41. This contract provides for building embankments at Irondequoit creek crossing. Length of contract, about 0.8 mile. Butler Bros. Construction Company of New York city, contractors. L. G. Fisher, Assistant Engineer, has been in charge of this contract.

"As last reported a 70-ton Bucyrus steam-shovel, with three 30-ton Vulcan locomotives and 6-yard dump cars, and a 12-inch suction hydraulic dredge are employed in the building of the two embankments on this contract. The west embankment, so-called, was completed with the exception of clay lining on the prism side, in October, 1909. This embankment has a top width of 16 feet, a width at canal grade — 16 feet below the top — of 96 feet and a maximum bottom width of 376 feet, the lowest part of the bank being about 55 feet below the top. This bank is formed of clear sand, brought from a borrow pit, with a maximum haul of three-fourths of a mile. The material was dumped from 6-yard standard gage cars and washed to the proper position in the embankment by water jets with 1-inch nozzles, the supply of water being the adjacent canal. The maximum month's work for the shovel, working two shifts, was July, 1909, when a total of 93,537 cu. yds. was taken out of the borrow pit and placed in embankment.

"The east embankment was built with a 12-inch suction dredge for the lower portion and the shovel used on the west embankment for the upper portion. This embankment extends across the original course of Irondequoit creek, the bed of which consisted of from 6 to 8 feet of mud, stumps and other organic matter. The dredge pumped out this underlying material down to firm sand and then on August 20, 1909, moved to a sand hill about

200 yards away and began cutting a new channel through the hill for the creek. The top of the borrow pit hill was upwards of 90 feet above the new creek bed. The dredge continued pumping in the new channel till February 7, 1910, when it shut down on account of the severe cold. Up to that time, however, it had raised most of the site of the east embankment from the excavated bed 6 feet below water level to an average height of about 10 feet above the water. On March 21 the dredge was again started, but soon worked into a bank of cemented gravel and closed down, as it was deemed best to do work with the steam-shovel.

"The steam-shovel was moved across the canal as soon as navigation closed in November, 1909, and on December 2 began excavating in the sand hill, the train outfit transporting the material across the creek and marsh over a trestle 600 feet long and depositing it in the east embankment, using water jets to wash the material away from the tracks.

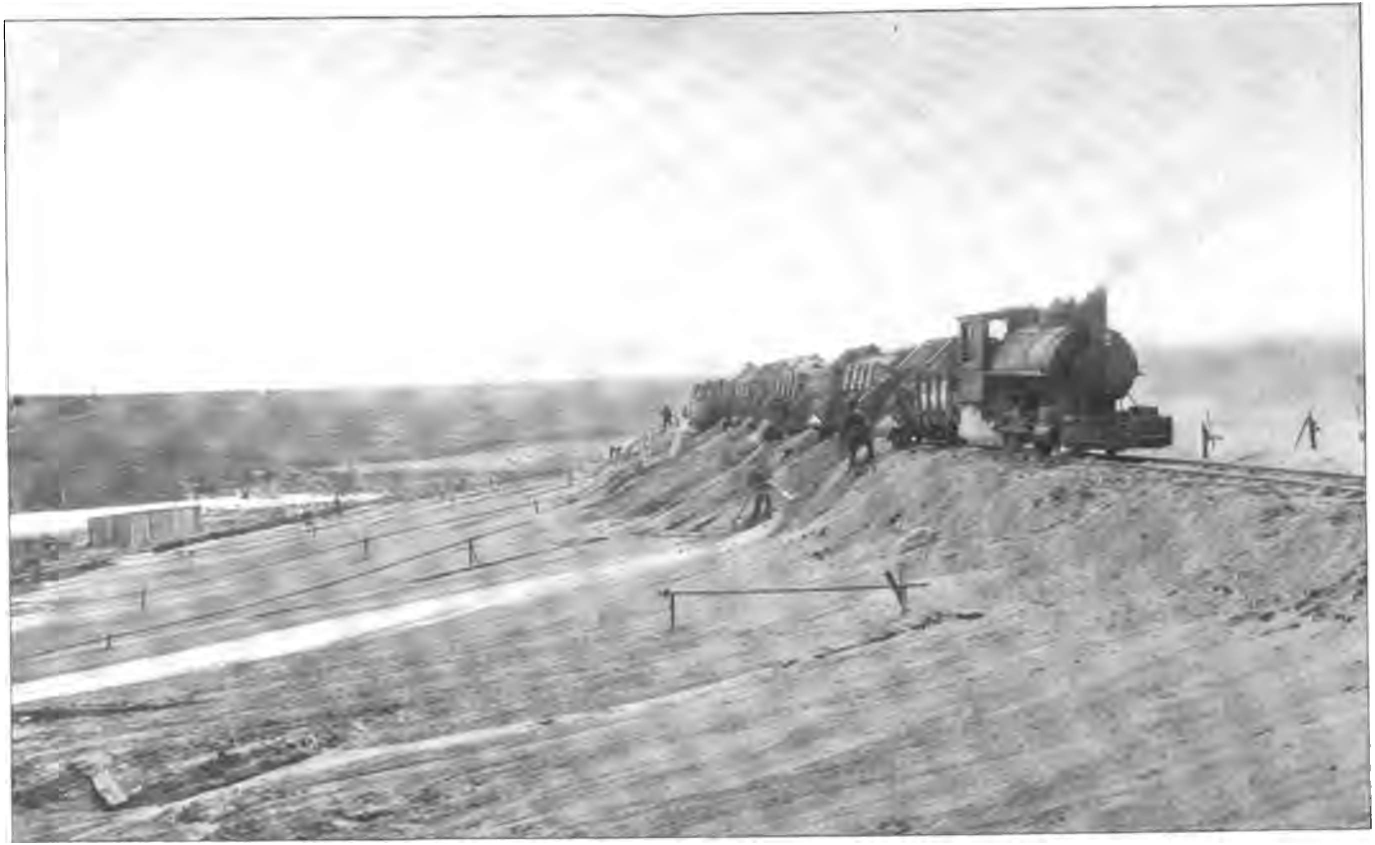
"This east embankment has a top width of 182 feet, a maximum height of 58 feet and maximum bottom width of about 436 feet. A concrete box culvert, 2 by 2 ft., has been built under the east end of the east embankment, to drain the basin between the new bank and the existing berm bank of the canal.

"The maximum monthly output of the steam-shovel, working two 8-hour shifts per day, occurred in April, 1910, when a total of 95,852 cu. yds. of material was taken out of the borrow pit and placed in embankment.

"The following table gives the amount of work to be done and the percentage done during the fiscal year on this contract:

ITEMS OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing ..... lump sum	$250	$17 50	$137 50	7	55
Grubbing ..... cu. yds.	19,000	5,203	18,951	27.4	100
Excavation ..... cu. yds.	1,072,000	539,422	875,726	50.3	81.7
Forming embankment ..... cu. yds.	865,000	512,686	817,304	59.2	94.4
Second-class concrete ..... cu. yds.	320	203	203	63.4	63.4*
Fourth-class riprap ..... cu. yds.	320	0	0	0	0
Expanded metal ..... sq. ft.	1,800	1,586	1,586	88	88*
Maintaining highway traffic ..... lump sum	$1,000	$ 800	$800	80	80
Gross estimate	$281,330	$143,350	$233,760	52.2	84.3

* Items represent all work that needs to be done.



Barge Canal, Contract No. 41.

Formation of embankment at Irondequoit creek crossing, material being hauled in dump-cars and spread by water-jets.

"*Contract No. 23.* This contract provides for the construction of a land line from King's Bend (west end of contract No. 63) to the Genesee river, a distance of 5.63 miles. Millard & Lupton Company, of Philadelphia, Pa., contractors. F. T. Marsh and H. R. Wickham, Assistant Engineers, have at different times been in charge of this contract.

"As noted in the last report, no contract work had been done at the beginning of this fiscal year, though considerable plant had been delivered.

"Some of the main features of this contract are the excavation of two million cu. yds. of earth from the deep cut in the 'divide,' transporting it two miles or more and compacting it into embankments on each side of the prism. For 11,000 feet at the western end of the contract the prism is in 'cut,' varying from fourteen to sixty-five feet, then for 11,000 feet east of this section the prism is made entirely by embankments, varying from fourteen to thirty-two feet in height, with a top width of eight feet, slopes of 1 on 2, and reinforced on the outside with upwards of forty feet width of spoil bank. On the face of it, it is a simple job of excavation and transportation, but actually it is a difficult job of excavating — excavating material that is for the most part a heavy clay, transporting it two miles, then placing, spreading and compacting it into impervious embankment. The material is admirably suited for the purpose, being a glacial deposit made up of clay, sand and gravel in varying proportions that will roll into a well nigh perfect embankment.

"The contractors' main plant consists of the following: Four 70-ton Bucyrus steam-shovels. One 70-ft. boom, 1½-yd. bucket Browning excavator. Nine narrow-gage locomotives of from 12 to 18 tons weight. Sixty-four 4-yd., narrow-gage dump cars. Two 60-ton Mogul locomotives. Five 40-ton Vulcan locomotives equipped with air brake and air compressor for dumping cars. Forty-two 12-yd. air dump cars. Two 10-ton steam rollers. Two traction engines. Two Western spreader cars with wings having 15 ft. reach. A cableway with 1,200 feet span between towers and 2 Koering 2-yd. mixers for concrete plant.

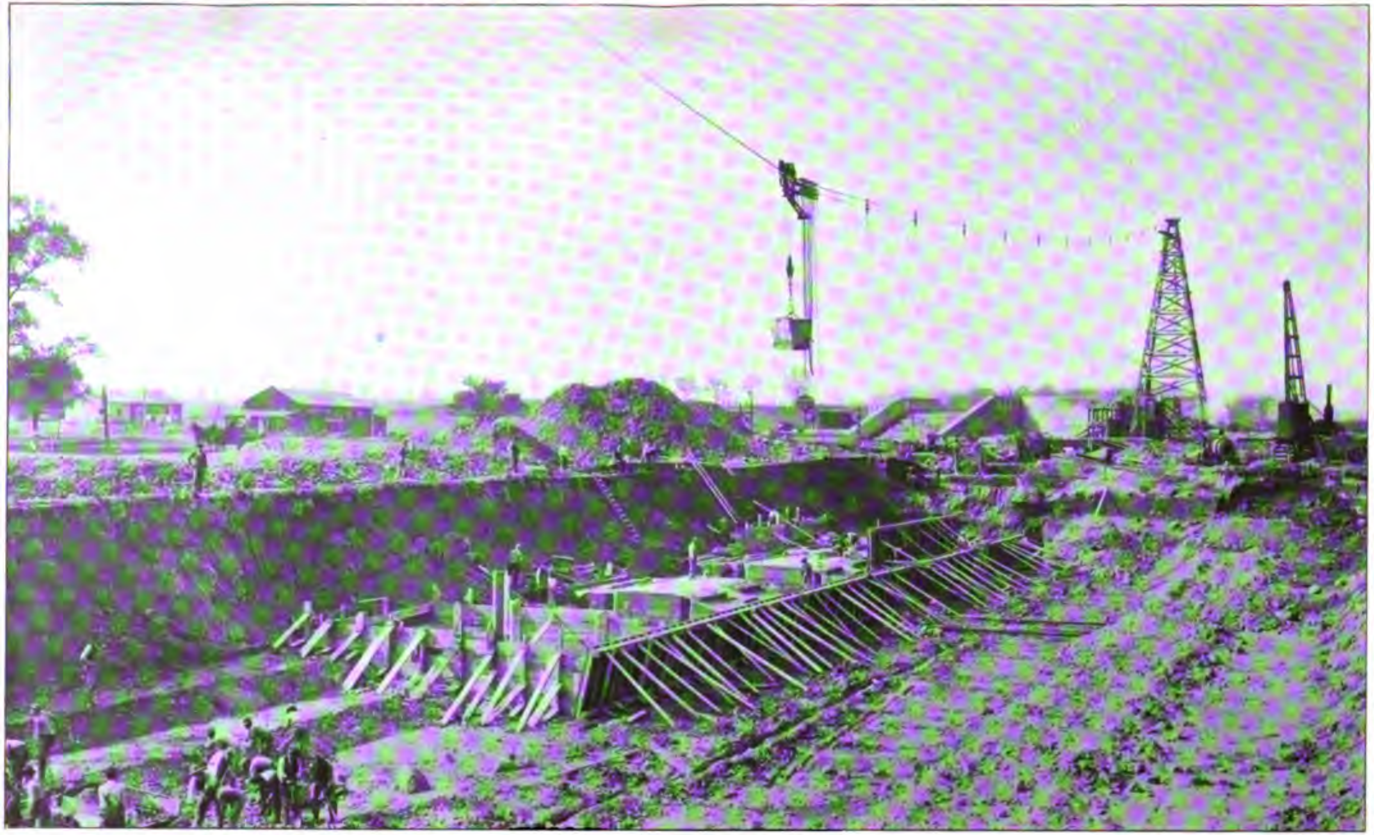
"Three steam-shovels with train equipment have worked the larger part of the time since October 19, 1909, when actual work began, excavating in the deep cut and placing the material in the embankments about 2 miles east of same to South avenue.

"The prism east of lock No. 32 has been nearly excavated, as well as the site for lock No. 32. This material was all placed in spoil banks. The prism between locks Nos. 32 and 33 is about 60 per cent excavated. At the upper guide wall and spillway of lock No. 32 the site was excavated and about 1,300 linear feet of piles were driven, when the character of the driving indicated that the underlying soil was such that piles could safely be omitted. Accordingly, under Alteration No. 2, foundation piles are to be omitted from lock No. 32 and its upper and lower guide walls. Up to September 30 about 1,066 cu. yds. of concrete have been placed in the upper guide wall and spillway of lock No. 32.

"Excavation for Allen's creek culvert under the canal was started in July, 1910, and concrete work was started on August 25. Up to September 30 about 781 cu. yds. of concrete and 28½ tons of metal reinforcement have been placed in this structure.

"The following table shows total amount of work to be done and also the progress during the present fiscal year on this contract:

ITEMS OF WORK.		Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Coffer-dams, pumping, etc	lump sum	$9,000	$90	$90	1	1
Clearing	lump sum	$600	$420	$420	70	70
Grubbing	cu. yds.	35,200	34,794	34,794	99.9	99.9
Excavation	cu. yds.	2,928,000	627,150	627,150	21.4	21.4
Round timber bracing	lin. ft.	3,000	0	0	0	0
Sheeting and bracing	M. ft. B. M.	300	0	0	0	0
Forming embankment	cu. yds.	1,095,000	311,951	311,951	28.5	28.5
Lining	cu. yds.	4,530	0	0	0	0
Sawed lumber, yellow pine or Douglas fir	M. ft. B. M.	33	0	0	0	0
White oak lumber in sills and gates	M. ft. B. M.	16	0	0	0	0
Sawed lumber in needles	M. ft. B. M.	13	0	0	0	0
Foundation piles	lin. ft.	323,900	1,313	1,313	4.1	4.1
Wooden sheet-piling	M. ft. B. M.	242	0	0	0	0
Steel sheet-piling	sq. ft.	4,500	0	0	0	0
Second-class concrete	cu. yds.	77,600	1,847	1,847	2.4	2.4
Second-class reinforced concrete	cu. yds.	770	0	0	0	0
First-class masonry coping	cu. yds.	14	0	0	0	0
Dry retaining wall	cu. yds.	39,400	0	0	0	0
Wash wall	cu. yds.	38,200	0	0	0	0
Second-class stone paving	sq. yds.	280	0	0	0	0
Third-class stone paving	sq. yds.	3,380	0	0	0	0
First-class riprap	cu. yds.	200	0	0	0	0
Second-class riprap	cu. yds.	860	0	0	0	0



BARGE CANAL, CONTRACT NO. 23.
View at lock No. 32, showing method of conveying concrete by cableway.

ITEMS OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Third-class riprap....cu. yds.	770	0	0	0	0
Fourth-class riprap....cu. yds.	5,200	0	0	0	0
Grouted riprap....cu. yds.	1,100	0	0	0	0
Cast iron pipe and specials....lbs.	43,600	0	0	0	0
Structural steel....lbs.	920,000	78	78	0.1	0.1
Metal reinforcement....lbs.	298,400	59,485	59,485	19.9	19.9
Iron casting, plain....lbs.	97,800	0	0	0	0
Iron casting, machined....lbs.	38,080	0	0	0	0
Metal in guard-lock gates....lbs.	425,000	0	0	0	0
Metal in buffer-beams....lbs.	170,000	0	0	0	0
Metal in lock-gates....lbs.	525,600	0	0	0	0
Metal in lock-valves....lbs.	140,000	0	0	0	0
Brick lining....cu. ft.	17,400	0	0	0	0
Wood pavement, 2¾" thick....sq. yds.	2,300	0	0	0	0
Wooden fence....lin. ft.	11,800	0	0	0	0
Wrought iron pipe railing....lin. ft.	230	0	0	0	0
Lattice railing....lin. ft.	1,100	0	0	0	0
Storehouses....No.	3	0	0	0	0
Office buildings....No.	3	3	3	100	100
Gate hoists, light....No.	2	0	0	0	0
Gate hoists, heavy....No.	2	0	0	0	0
Maintaining highway traffic....lump sum	$2,000	$200	$200	10	10
Gross estimate....	$1,887,036	$215,740	$215,740	11.7	11.7

ERIE CANAL, RESIDENCY NO. 9-B.

Resident Engineer Thomas J. Morrison reports:

"Residency No. 9-B extends from the Genesee river at Rochester to the Monroe-Orleans county line, a distance of 22.5 miles. It comprises contracts Nos. 21, 6, 60 and 61.

"*Contract No.* 21. This contract calls for excavating the canal prism and constructing guard-lock, highway bridge abutments and all appertaining work between the Genesee river and the east end of contract No. 6, a distance of 2.43 miles.

"During the fiscal year appropriation surveys were made for the land to be taken, and on the 7th day of April, 1910, the contract was let to Lane Brothers Co., of Altavista, Va. H. J. Hemstreet, Assistant Engineer, has been in charge of the work.

"The contractors erected quarters for the laborers and laid a 4-inch water main along the line of the canal. On June 6, 1910, actual work was begun by a 70-ton Atlantic shovel (No. 1), with 6-yard cars and 18-ton locomotives running on standard-gage tracks. This plant was installed near the east end of the contract, between the Scottsville road and the Pennsylvania spur line. A similar outfit (shovel No. 2) began work on the same section on June 21. These two plants worked single shifts daily for a short time, when they were put on double-shift. The material encountered is a heavy clay, giving some difficulty when wet. It was hauled to a spoil bank adjacent to the cut.

"On August 1 a third shovel, Marion, model No. 100, served by 16-yard K. & J. air dump cars, began work on the cut between the Pennsylvania R. R. spur and Brooks avenue. This plant has done excellent work.

"A fourth shovel, Marion, model No. 75, began work on Sept. 29 at Scottsville road and is working west. The table given below shows the output of the four steam-shovels up to the end of the fiscal year.

MONTH.	SHOVEL NO. 1.		SHOVEL NO. 2.		SHOVEL NO. 3.		SHOVEL NO. 4.	
	Number of shifts.	Cu. yds.	Number of shifts.	Cu. yds.	Number of shifts.	Cu. yds.	Number of shifts.	Cu. yds.
1910.								
June	28	20,252	8½	7,384	......	......	......	....
July	37	29,832	30½	28,662	......	......	......	....
August	40	33,005	33	22,004	26	46,503	......	....
September	39	30,540	38	35,015	20	37,066	2	485

"The following table gives the percentage of work done during the year on this contract:

ITEMS OF WORK.		Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Clearing	lump sum	$250	$100	$100	40	40
Excavation	cu. yds.	2,350,000	290,748	290,748	12.3	12.3
Sheeting and bracing	M. ft. B. M.	16	0	0	0	0
Channeling	sq. ft.	390,000	0	0	0	0
Embankment	cu. yds	100	0	0	0	0
Lining	cu. yds.	560	0	0	0	0
Sawed lumber	M. ft. B. M.	3	0	0	0	0
Second-class concrete	cu. yds.	6,400	0	0	0	0
Dry retaining wall, including coping	cu. yds.	2,200	0	0	0	0
Rock spoil protection	cu. yds.	8,000	0	0	0	0
Wash wall	cu. yds.	8,000	0	0	0	0
Cobble paving	sq. yds.	400	0	0	0	0
Third-class riprap	cu. yds.	100	0	0	0	0
Fourth-class riprap	cu. yds	100	0	0	0	0
12" vitrified pipe	lin. ft.	27	0	0	0	0
Structural steel	lbs.	2,400	0	0	0	0
Metal reinforcement	lbs.	9,000	0	0	0	0
Iron castings	lbs.	12,600	0	0	0	0
Wooden fence	lin. ft.	310	0	0	0	0
Metal guard-gates	lbs.	448,000	0	0	0	0
Drilling bolt holes in rock	lin. ft.	1,000	0	0	0	0
Maintaining traffic	lump sum	$2,000	$220	$220	11	11
Coffer-dams, etc	lump sum	$4,000	$400	$400	10	10
Gross estimate		$1,323,150	$141,732 78	$141,732 78	10.7	10.7

" *Contract No.* 6. This contract extends from the west end of contract No. 21, just south of the Buffalo road west of Rochester, to a point near the junction with the old canal east of South Greece. F. A. Maselli is the contractor. H. J. Hemstreet, Assistant Engineer, has had charge up to November 1, 1909; B. L. G. Rees, Assistant Engineer, to February 1, 1910, and J. V. Hogan, Assistant Engineer, since that date.

" The bridge conveyor has worked from Sta. 2614 east to Sta. 2579, completing the prism cut between those stations.

" Six channelers have worked in conjunction with the conveyor, cutting down the rock sides from above the proposed water surface to grade.

" Two steam-shovels with the necessary locomotives and cars have completed the trimming of slopes and cleaning up of the bottom from Sta. 2678 east to Sta. 2645. This makes a finished section of canal with the exception of a little cleaning up from Sta. 2660 to Sta. 2678.

" The spoil deposited temporarily within 100 feet of the road lines at the Lee road crossing has been removed by steam-shovel. That at Lyell road has been partly removed.

" Wash walls have been built at the west end of the contract from Sta. 2714 to Sta. 2744, with the exception of a portion of the wall from Sta. 2729 to Sta. 2731, north side.

" Concrete retaining walls have been built on both sides from Sta. 2627 to Sta. 2634.

" The following table gives the quantities of material excavated by each unit of plant for each month of its operation:

MONTH.	Bridge conveyor.	Steam-shovels Nos. 1 and 2 and train outfits.
1909.	*Cu. yds. rock.*	*Cu. yds. rock.*
October	17,035.2	11,199.9
November	19,350.9	11,185.2
December	3,551.8	5,342.9
1910.		
January	11,323.7	4,910.9
February	7,874.1	0.0
March	9,857.9	0.0
April	12,255.9	13,831.5
May	10,368.0	2,531.5
June	11,564.4	1,655.0
July	10,124.0	1,656.0
August	19,865.7	828.0
September	22,622.3	1,655.0

"The following is a table showing the quantity of channeling done and the number of shifts worked during each month of the year:

MONTH.	Square feet of channeled surface.	Number of 8-hour shifts worked.
1909.		
October	10,816	251
November	8,802	270
December	6,935	172
1910.		
January	5,468	149
February	6,831	122
March	6,320	160
April	10,017	251
May	1,292	60
June	5,166	156
July	6,263	144
August	6,187	148
September	4,646	141

"The following table gives the amounts of work done during the year and to date on this contract:

ITEMS OF WORK.	Preliminary estimate, as modified by alterations 1 to 7	Work done during year	Total work done to date.	Per cent of work done during year.	Per cent of work done to date
Clearing . . . acres	27	6.4	27	20	100
Grubbing . . . cu. yds.	4,500	0	3,711	0	82
Excavation . . . cu. yds.	2,095,460	218,386	1,998,955	10.4	95.4
Channeling . . . sq. ft.	228,840	78,743	178,734	34.4	78.4
Embankment . . . cu. yds.	38,000	2,111	34,835	5.5	91.5
Puddle . . . cu. yds.	1,700	0	0	0	0
White oak timber . . . ft. B. M.	500	0	0	0	0
Hemlock timber . . . ft. B. M.	500	0	0	0	0
Second-class concrete . . . cu. yds.	3,847*	2,386	3,817	62	100
Third-class concrete . . . cu. yds.	300	0	264.6	0	88
First-class masonry coping . . . cu. yds.	15	0	11.75	0	78
Wash wall . . . cu. yds.	9,990	9,698	9,698	97	97
Stone paving . . . sq. yds.	60	0	0	0	0
Fencing . . . lin. ft.	1,400	0	0	0	0
Macadam pavement . . . sq. yds.	500	0	0	0	0
Gross estimate	$1,028,549 80	$131,194 24	$982,351 45	12.79	95.69

* Increased from 1,757 cu. yds. by resolution of Canal Board, Dec. 23, 1909.

"*Contract No.* 60. This contract extends from the west end of contract No. 6 to about one-half mile west of Adams Basin bridge, a distance of 8.53 miles.

"Progress on the contract during the year by the Empire Engineering Corporation has been very good. The work at various times has been under the direction of G. M. Briggs, Chas. L. Henderson and C. L. Baldwin, Assistant Engineers.

"The South Greece cut-off made by steam-shovel and train outfit has been finished, including the retaining walls and wash walls.

"The ladder-dredge *Mohawk* has continued its progress easterly in the prism and has reached Sta. 3171. This dredge will probably finish the heavy prism excavation during the present navigable season. While progress with this plant has been fairly satisfactory this year, it does not appear to be an entirely successful machine for canal work. The table below gives the output for each month of its operation during the year.

MONTH.	Cubic yards excavated.	Number of 8-hour shifts worked.
1909.		
October	25,500	78
November	20,516	39
1910.		
May	6,394	39
June	18,903	78
July	25,723	78
August	25,127	81
September	25,085	78

"Besides the work done by the large units described above, prism excavating has been done and embankment built at a number of points by teams and scrapers, wagons and Koppel cars.

"A revolving crane, mounted on a scow and equipped with an orange-peel bucket, has been used to remove material from the prism left by the ladder-dredge.

"The prism has been cleaned up from the west end of the contract east to Sta. 3415.

"Considerable wash wall has been built along the line of the contract.

"A concrete retaining wall has been built on the south side of the canal at Adams Basin.

"During the past winter old culverts Nos. 49, 50, 51 and 53 were taken out and new pipe culverts built. A culvert was built at the junction of contracts Nos. 6 and 60 and old culvert No. 54 was jacketed with concrete and a new concrete floor put in place.

"Approaches to all the bridges were completed, except those of bridge No. 95.

"The south abutment of the guard-gate at Sta. 3215+50 has been built.

" The small amount of work remaining to be done on the three waste-weirs of the contract was done during the year.

" The new highway on the south side of the canal from bridge No. 100 to bridge No. 101 was built and opened to traffic.

" Where the material forming the banks is light, considerable puddle has been placed on the canal face, or sheet-piling driven into the bank.

" Following is a table showing the amounts of work done during the year and to date on the contract:

ITEMS OF WORK.	Preliminary estimate, as modified by alterations 1 to 7.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Coffer-dams, etc .... miles	8.5	0.5	6.5	5.8	76.4
Clearing .... lump sum	$2,600	$936	$2,470	36	95
Grubbing .... cu. yds.	47,644	14,321	33,285	30	69.7
Excavation .... cu. yds.	1,224,030	372,137	844,614	30.6	69
Sheeting and bracing .... ft. B. M.	135,000	53,131	77,774	39.3	57.6
Channeling .... sq. ft.	26,000	0	15,312	0	58.9
First-class embankment .... cu. yds.	749,040	200,241	403,890	26.7	53.9
Second-class embankment .... cu. yds.	191,800	51,218	121,486	26.7	63.3
Lining .... cu. yds.	26,710	7,365	9,171	27.6	34.3
Puddle .... cu. yds.	63,747	5,368	9,612	8.4	15
Sawed lumber, yellow pine .... ft. B. M.	41,000	3,337	22,393	8.1	54.6
Foundation piles .... lin. ft.	19,050	0	5,176	0	37.8
Wooden sheet-piling .... ft. B. M.	42,000	8,076	8,076	19.2	19.2
Second-class concrete .... cu. yds.	13,319	4,294	12,450	32.2	93.4
Third-class concrete .... cu. yds.	3,049	527	1,933	17.2	63.4
Reinforced concrete .... cu. yds.	1,580	0	1,526	0	96.6
First-class masonry coping .... cu. yds.	15	0	1.7	0	11.3
Wash wall .... cu. yds.	66,721	30,301	38,980	45.4	58.4
Second-class stone paving .... sq. yds.	6,755	776	1,457	11.4	21.5
Third-class stone paving .... sq. yds.	1,860	1,223	1,435	65.7	77.1
Third-class riprap .... cu. yds.	559.4	136	136	24.3	24.3
Fourth-class riprap .... cu. yds.	100	26	57	26	57
Cast iron culvert pipe .... lbs.	676,250	406,575	490,400	60.1	72.5
12" vitrified pipe, laid .... lin. ft.	20	0	20	0	100
Trench and backfill, 12" vitrified pipe .... lin. ft.	20	0	20	0	100
Structural steel .... lbs.	817,360	790,533	804,900	96.7	98.4
Metal reinforcement .... lbs.	101,840	321	90,197	0.3	88.5
Wooden pavement, 3" thick .... sq. yds.	1,330	0	1,304.2	0	98.1
Wooden pavement, 4" thick .... sq. yds.	650	0	622.1	0	95.7
Wooden fence .... lin. ft.	16,591	8,371	10,591	50.4	63.8
Wrought iron pipe railing .... lin. ft.	205	138	138	67.3	67.3
Lattice railing .... lin. ft.	410	0	398	0	97.1
Sluice-gate valves, 36" x 40" .... No.	7	1	7	14.3	100
Sluice-gate valves, 33" x 33" .... No.	2	1	2	50	100
Repointing old masonry .... lin. ft.	1,000	1,150	1,150	100	100
Maintaining navigation .... lump sum	$11,000	$3,102	$7,128	28.2	64.8
Maintaining traffic .... lump sum	$3,500	$1,753 50	$3,251 50	50.1	92.9
36" vitrified pipe, laid .... lin. ft.	244	239	239	98	98
Additional bailing and draining .... lump sum	$1 500	$1,005	$1,005	67	67
Gross estimate	$1,476,641 83	$416,941 62	$939,858 71	28.2	63.6

" *Contract No.* 61. This contract extends from about one-half mile west of Adams Basin bridge to the Monroe-Orleans county line, a distance of 7.39 miles. Cleveland & Sons Co. of Brockport are the contractors and A. S. Milinowski, Assistant Engineer, is in charge.

"Lidgerwood excavators Nos. 1 and 2 have continued to work west and the prism is roughly bottomed out from the east end of the contract to Sta. 3558.

"A third Lidgerwood excavator has been installed in the Sime's borrow pit west of Brockport. The material excavated has been hauled in cars and placed in embankment on the south side, west of the borrow pit.

"The following table shows the monthly output for the three excavators for the year:

MONTH.	EXCAVATOR NO. 1.		EXCAVATOR NO. 2.		EXCAVATOR NO. 3.	
	Number of shifts.	Cu. yds.	Number of shifts.	Cu. yds.	Number of shifts.	Cu. yds.
1909.						
October	20	8,620	15¾	2,252	....	....
November	44¼	10,272	*Nos. 1 & 2	together	....	....
December	48½	6,921	Nos. 1 & 2	together	....	....
1910.						
January	45	5,366	Nos. 1 & 2	together	....	....
February	23	1,790	22	3,747	....	....
March	12	1,204	27	9,745	....	....
April	38	3,087	24	8,092	....	....
May	52	**0	26	3,865	....	....
June	52	4,385	36	5,517	....	....
July	50 unloaded scows filled by No. 2		50	8,886	....	....
August	36	654	54	7,619	4	874
September	17	1,989	39	5,052	18	4,806

* No. 1 excavated material from south bank and deposited it in bed of canal, from which No. 2 removed it and placed it on north bank.

** No excavation estimated, as it was rehandled to its final position.

"Besides the work done by these units, considerable excavation and embankment has been made at various points by teams and scrapers.

"Considerable wash wall has been built on both sides from Brockport to the east end of the contract.

"The Brockport retaining wall has been continued to the east end. It is expected to complete this wall during the coming winter.

"Culverts Nos. 60, 61 and 62 have been extended, the abutments of bridge No. 109 built and the Brockport waste-weir completed, with the exception of the wings. Approaches to bridges Nos. 106 and 109 have been partly built.

"Following is a table showing the amounts of work done during the year and to date on this contract:

ITEMS OF WORK.	Preliminary estimate, as modified by alteration 3.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Coffer-dams, etc. .... miles	7.4	1	1	13.5	13.5
Clearing .... lump sum	$2,400	$1,440	$2,160	60	90
Grubbing .... cu. yds.	48,374	12,314	18,668	25.4	38.5
Excavation .... cu. yds.	953,033	175,301	267,546	18.4	28
Sheeting and bracing .... ft. B. M.	20,000	5,876	10,427	29.4	52.2
First-class embankment .... cu. yds.	564,260	82,314	113,719	14.6	20.2
Second-class embankment .... cu. yds.	96,000	39,085	46,314	40.7	48.2
Lining .... cu. yds.	18,876	15	15	0	0
Puddle .... cu. yds.	14,584	292	292	2	2
Sawed lumber, yellow pine .... ft. B. M.	29,000	150	470	0.5	1.6
Foundation piles .... lin. ft.	3,400	1,137	1,137	33.3	33.3
Wooden sheet-piling .... ft. B. M.	5,000	3,586	3,586	71.7	71.7
First-class concrete .... cu. yds.	65	0	0	0	0
Second-class concrete .... cu. yds.	10,840	3,443	4,597	31.7	42.4
Third-class concrete .... cu. yds.	1,514	433	622	28.6	41.1
Reinforced concrete .... cu. yds.	350	80	156	22.9	44.6
First-class masonry coping .... cu. yds.	8	0	0	0	0
Wash wall .... cu. yds.	63,569	8,640	11,171	13.6	17.5
Second-class stone paving .... sq. yds.	498	23	23	4.6	4.6
Third-class stone paving .... sq. yds.	1,200	0	0	0	0
Cobblestone paving .... sq. yds.	275	0	0	0	0
Third-class riprap .... cu. yds.	280	0	0	0	0
Cast iron pipe and specials .... lbs.	300,100	42,260	42,260	14.1	14.1
12" vitrified pipe, laid .... lin. ft.	148	0	124	0	83.8
24" vitrified pipe, laid .... lin. ft.	110	94	94	85.4	85.4
Structural steel .... lbs.	444,490	2,999	3,745	0.7	0.8
Metal reinforcement .... lbs.	44,598	10,484	19,319	23.5	43.3
Wooden pavement, 2¾" thick .... sq. yds.	820	0	0	0	0
Wooden pavement, 3¾" thick .... sq. yds.	220	0	0	0	0
Wooden fence .... lin. ft.	8,500	0	0	0	0
Wrought iron pipe railing .... lin. ft.	660	0	0	0	0
Lattice railing .... lin. ft.	330	0	0	0	0
Gates, standards and operating machinery No.	3	3	3	100	100
Relaying board walks .... sq. ft.	900	0	0	0	0
Repointing old masonry .... lin. ft.	1,000	0	0	0	0
Drilling bolt holes in old masonry .... lin. ft.	1,400	267	485	19.1	34.7
Maintaining navigation .... lump sum	$10,000	$2,500	$2,500	25	25
Maintaining highway traffic ...... lump sum	$2,000	$600	$600	30	30
Additional bailing and draining .. lump sum	$4,000	0	0	0	0
Gross estimate	$1,088,890 03	$187,947 14	$269,235 17	17.3	25

"Besides the contracts noted above, contract No. 75 has been made, for the construction of superstructures of guard-gates on contracts Nos. 60 and 61. No work has been done on this contract.

"Surveys, borings, etc., at the site of the proposed Genesee river dam, contract No. 59, have been made and maps and records of the results forwarded to the Division Engineer.

"Daily readings have been taken of the gages on the Genesee river; one at Elmwood avenue bridge, Rochester, and the other on Ballantine bridge."

ERIE CANAL, RESIDENCY NO. 10-A.

Resident Engineer Charles A. Ingersoll reports:

"This residency extends from the westerly line of Monroe county to a point 100 feet east of Gasport bridge, in the village of Gasport, Niagara county. It embraces contracts Nos. 9, 62, 64 and 65. Of these contracts but two, Nos. 9 and 64, are under construction.

"Contract No. 62, extending from Monroe county line to Eagle Harbor, was awarded to I. M. Ludington's Sons, Incorporated, of Rochester, N. Y., on August 11, 1910, but active construction work has not yet been started.

"*Preliminary Work.*

"The preliminary work on this residency has consisted principally of appropriation surveys and the preparation of appropriation maps, on contracts Nos. 9, 62 and 64.

"The maps for contract No. 9 have been completed; for contract No. 64 the maps are 95 per cent completed. On contract No. 62 about 75 surveys have been made. On this contract the base line has been rerun. The proposed center line has been recomputed and necessary computations for an off-set center line have been made.

"During the year, various reports, surveys and investigations pertaining to the preparation of plans for contracts Nos. 62 and 65 have been made.

"*Construction Work.*

"*Contract No.* 9. This contract provides for the improvement of the present canal from a point 0.164 mile east of Eagle Harbor to a point 0.09 mile west of Beal's bridge; length, 5.682 miles. Thomas Crimmins Contracting Company, of New York city, contractors. Arthur S. Whitbeck, Assistant Engineer, in charge. Amount of contract, including alterations Nos. 2, 3, 5, 6, 7, 8 and 9, $801,221.43; amount of work done to October 1, 1910, $600,060; amount of work done during last fiscal year, $271,080. This contract is about 96 per cent completed.

"The excavation on this contract has been made principally by two Lidgerwood excavators, with 80-foot booms and equipped with 1½-yard scraper buckets. These machines started operations near Knowlesville, one working easterly and the other working westerly therefrom. They were set up on the berme side. Each machine started excavating when the water was in the canal, the material being placed in cars and hauled away, except at points where it was possible to deposit the material upon the site of embankment, or spoil areas, directly from the bucket. It was found that material thus deposited formed excellent banks. The practice of transporting wet material in cars was found to be undesirable, chiefly on account of the difficulty of maintaining stable tracks, due to the dripping from the cars.

" At the close of navigation both machines were placed in the bed of the canal and in this position it is found that their work is most effective, it being then possible to work close to line and to follow the machine, trimming the slopes by hand, and thereby actually completing the prism station by station.

" The prime requisite for the success of this method of working these machines is an effectual drainage of the canal bottom.

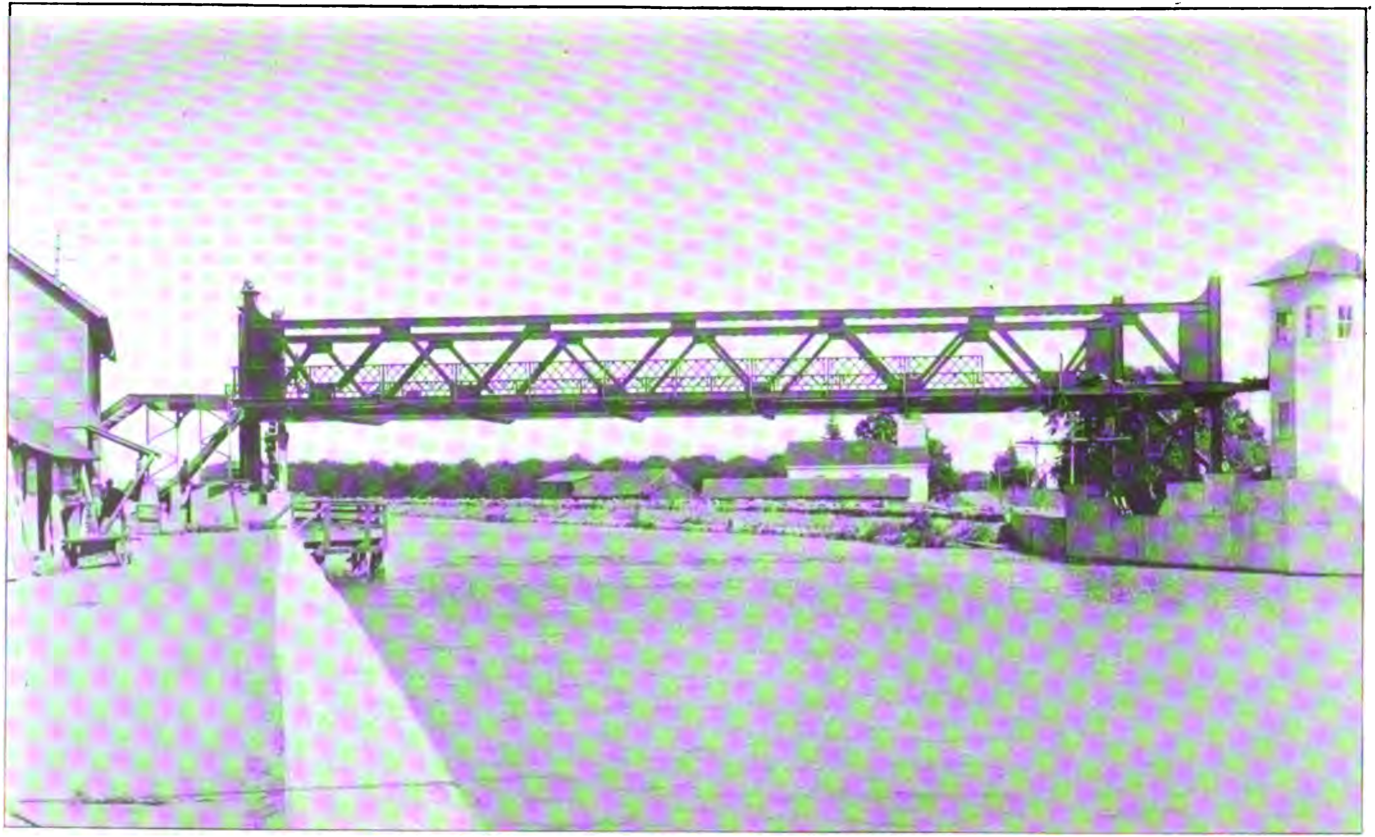
" Other excavation has been performed on this contract by the use of slip scrapers and locomotive cranes.

" All structures on this contract have been completed, with the exception of the lift bridges at Eagle Harbor and Knowlesville. The operating machinery for these bridges is now being installed.

" The steel superstructures of all bridges on this contract have been furnished by the Receivers of the J. B. & J. M. Cornell Company, of New York city.

" The following table shows the status of this contract to date:

ITEMS OF WORK.		Preliminary estimate, including alterations.	Work done during year.	Total work done to date.	Per cent. of work done during year.	Per cent of work done to date.
Clearing	lump sum	$1,836	0	$1,620	0	90
Grubbing	cu. yds.	40,220	9,850	26,494	24.5	65.9
Excavation	cu. yds.	743,350	204,986	528,807	27.6	71.1
Sheeting and bracing	ft. B. M.	70,000	6,142	19,914	8.8	28.4
Forming embankment	cu. yds.	428,844	142,038	315,750	33.1	73.6
Lining	cu. yds.	14,539	4,360	7,223	30	49.7
Puddle	cu. yds.	4,000	2,811	3,200	70.3	80
Sawed lumber	ft. B. M.	95,000	45,395	72,764	47.8	76.
Foundation piles	lin. ft.	30,770	0	2,434	0	7.9
Second-class concrete	cu. yds.	5,882	3,314	5,192	56.3	88.[illegible]
Third-class concrete	cu. yds.	4,430	537	3,412	12.1	77 3
Reinforced concrete	cu. yds.	1,390	1,052	1,254	75.7	90.
First-class masonry	cu. yds.	190	0	153.8	0	81 2



Barge Canal, Contract No. 9.
New lift bridge over Barge canal at Eagle Harbor.

ITEMS OF WORK.	Preliminary estimate, including alterations.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
First-class masonry backing..............cu. yds.	110	0	91.8	0	83.4
First-class masonry coping................cu. yds.	24	0	19	0	79.2
First-class masonry ringstones............cu. yds.	8	0	5.6	0	70
First-class masonry sheeting.............cu. yds.	70	0	45.6	0	65.1
Brick masonry..........................cu. yds.	17	6	6	35.3	35.3
Wash wall..............................cu. yds.	41,180	23,987	42,152	58.2	100
Second-class paving......................sq. yds.	440	28	101	6.4	23
Third-class paving.......................sq. yds.	1,350	827	962	61.3	71.3
Third-class riprap........................cu. yds.	5,187	119	278	2.3	5.3
Cast iron culvert pipe and specials............lbs.	939,400	203,318	871,323	21.6	92.7
8-inch vitrified pipe, laid..................lin. ft.	60	0	45	0	75
15-inch vitrified pipe, laid.................lin. ft.	60	0	45	0	75
Trenching and backfilling for 8-inch pipe....lin. ft.	60	0	45	0	75
Trenching and backfilling for 15-inch pipe....lin. ft.	60	0	45	0	75
Structural steel...............................lbs.	315,065	0	311,388	0	98.8
Metal reinforcement..........................lbs.	81,600	52,913	73,473	64.8	90
Flagstone walks.........................sq. yds.	20	0	0	0	0
Wooden fencing..........................lin. ft.	5,080	1,144	2,712	22.5	53.3
Wrought iron pipe railing..................lin. ft.	30	18	18	60	60
Lattice railing............................lin. ft.	850	0	0	0	0
Resetting catch basin covers.................No.	2	0	2	0	100
Maintaining navigation................lump sum	$8,000	0	$6,000	0	75
Maintaining highway traffic............lump sum	$3,000	$825	$2,075	27.5	69.2
Drilling bolt holes in old masonry..........lin. ft.	29	0	28	0	96.3
Lift bridge steel.............................lbs.	440,000	387,610	387,610	88.1	88.1
Machinery....................................lbs.	50,000	0	0	0	0
Electrical equipments.......................No.	2	0	0	0	0
Electric-pumps..............................No.	2	0	0	0	0
Operators' cabins...........................No.	2	1.8	1.8	90	90
Brick pavement..........................sq. yds.	84	0	0	0	0
Gross estimate..................................	$801,221 43	$271,073 52	$600,061 31	33.8	74.9

"*Contract No.* 64. This contract provides for the improvement of the present Erie canal from a point 600 feet west of the Prospect street bridge, Medina, to a point 100 feet east of the Gasport bridge; length, 9.91 miles. Empire Engineering Corporation, of New York city, contractors. R. H. Merrill, Assistant Engineer, in charge. Amount of contract, including alterations 2, 3, 5, 6 and 7, is $1,316,557.79; work done to October 1, 1910, $449,160; work done during past fiscal year, $227,210. The contract is about 34.1 per cent completed, based on the preliminary estimate.

"All structures on this contract, with the exception of two culverts and Reynale's Basin bridge, have been completed.

"During the winter months, two steam-shovels made excavations at the cut-off near Shelby Basin, at the guard lock approach west of Gorman's bridge and at the cut-off near Maybee's bridge. Some excavation has been made by locomotive cranes and slip scrapers. A considerable amount of wash wall stone has been delivered. The ladder-dredge, which has been operating on contract No. 66, was moved to this contract in September. It is now operating near Gasport and will work easterly over the contract.

" Niagara river gravel, with such proportions of cement as to obtain a proper mortar, has been used for concrete on this contract, with excellent results.

" The office of the assistant engineer in charge of this contract has been transferred from Middleport to the residency office at Medina.

" The following table shows the status of the work on this contract to date:

ITEMS OF WORK.		Preliminary estimate, including alterations.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Coffer-dams, pumping, bailing, etc.	miles	10	2	6	20	60
Clearing	lump sum	$2,600	0	$2,210	0	85
Grubbing	cu. yds.	55,142	6,005	15,902	10.9	28.8
Excavation	cu. yds.	1,109,681	134,396	283,083	12.1	25.5
Forming embankment, first-class	cu. yds.	410,738	49,979	121,987	12.1	29.7
Forming embankment, second-class	cu. yds.	117,210	14,207	55,088	12.1	47
Lining	cu. yds.	26,014	218	561	0.8	2.2
Puddle	cu. yds.	4,517	421	421	9.3	9.3
Sawed lumber	ft. B. M.	47,000	11,445	16,853	24.4	35.8
Foundation piles	lin. ft.	3,500	640	2,300	18.3	65.7
Wooden sheet-piling	ft. B. M.	134,000	23,456	23,456	17.5	17.5
Second-class concrete	cu. yds.	16,781	4,981	10,642	29.7	63.4
Third-class concrete	cu. yds.	3,219	924	2,323	28.7	72.1
Reinforced concrete	cu. yds.	720	286	653	39.7	90.7
First-class masonry	cu. yds.	64	48	48	75	75
First-class masonry backing	cu. yds.	0	0	0	0	0
First-class masonry bridge coping	cu. yds.	50	8	8	16	16
Wash wall	cu. yds.	69,422	4,968	7,429	7.2	10.7
Second-class stone paving	sq. yds.	2,050	52	129	2.5	6.3
Third-class stone paving	sq. yds.	2,915	270	270	9.3	9.3
Third-class riprap	cu. yds.	360	0	0	0	0
Cast iron pipe and specials	lbs.	1,098,785	403,904	862,970	36.7	78.5
Structural steel	lbs.	973,360	675,289	824,504	69.4	84.7
Metal reinforcement	lbs.	65,450	27,080	60,130	41.4	91.9
Wood pavement	sq. yds.	2,600	1,522	1,522	58.5	58.5
Wooden fence	lin. ft.	12,648	0	0	0	0
Sluice-gate valves	No.	7	2	5	28.6	71.4
Relaying of old masonry	cu. yds.	180	17	17	9.4	9.4
Repointing old masonry	lin. ft.	1,500	0	0	0	0
Maintaining navigation	lump sum	$13,000	$3,900	$7,800	30	60
Maintaining highway traffic	lump sum	$4,500	$1,980	$1,980	44	44
Additional bailing and draining	lump sum	$500	0	0	0	0
Gross estimate		$1,316,557 79	$227,213 89	$449,167 50	17.2	34.1

" *Contract No.* 62 provides for the improvement of the present Erie canal from the west line of Monroe county to the east end of Contract No. 9 at Eagle Harbor; length, 14.15 miles.

" I. M. Ludington Sons, Incorporated, of Rochester, N. Y., contractors. George D. Kellogg, Assistant Engineer, in charge. Amount of contract, $2,347,836.

" No actual construction work has been performed to date."

ERIE CANAL, RESIDENCY No. 10-B.

Resident Engineer C. J. McDonough reports:

"This residency extends from a point about 100 feet east of Gasport bridge to the guard-lock at Pendleton, Niagara county, a distance of 11.7 miles, and embraces contracts Nos. 66, 67 and 40, and also contracts not yet advertised for two lift bridges at Lockport and a guard-gate at Gasport. Of the foregoing contracts three have been let, viz., contracts Nos. 66, 67 and 40.

"*Contract No.* 66. This is the most westerly contract on the 60-mile level, and extends from 100 feet east of Gasport bridge to a point about 600 feet east of the Lockport locks, a distance of 6.35 miles.

"The contract was awarded September 22, 1908, to the Empire Engineering Corporation of New York and is to be completed October 15, 1911. Elias H. Anderson is the Assistant Engineer in charge.

"Considerable delay was experienced on account of the severe winter of 1909-10, and the consequent unfeasibility of making embankment from prism excavation, which is an essential feature of the contract. Twenty-five per cent of the work was completed during the year, of which amount 12.8 per cent was completed during the last four months. The bulk of the work was excavation, embankment, wash wall and concrete.

"Structures erected were Millard's bridge (the last of the new bridges), culverts Nos. 115½, 117 and new culvert No. 123, which was about 80 per cent completed at the last report. Four culverts and about 30 per cent of the concrete wall at Lockport are yet to be built.

"The elevator-dredge *Mineola,* operating six full working months and being idle six months when the canal was dry during the period of closed navigation, excavated 134,460 cubic yards. The remainder of the excavation was made by teams and two small scows, fitted with clam-shell and orange-peel, respectively.

"The substitution of Niagara river gravel for local sand and crushed stone in concrete has resulted in vastly improved concrete, both as to appearance and solidity.

"During the coming winter it is expected that the work below water will be completed.

"The following table shows the state of the contract to date:

ITEMS OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Coffer-dams, etc. miles	6.35	1.46	2.921	23	46
Clearing lump sum	$1,900	$380	$950	20	50
Grubbing cu. yds.	30,925	15,604	18,543	50.6	60
Excavation cu. yds.	661,532	213,311	308,059	32.2	46.7
Sheeting and bracing ft. B. M.	148,000	8,656	27,737	5.8	18.7
First-class embankment cu. yds.	287,472	66,368	87,518	23.1	30.5
Second-class embankment cu. yds.	61,600	17,295	45,158	28.1	73.2
Lining cu. yds.	17,384	667	736	3.9	4.2
Puddle cu. yds.	8,374	260	1,326	3.1	15.8
Sawed lumber ft. B. M.	18,000	2,024	17,850	11.3	100
Foundation piles lin. ft.	3,830	622	3,522	16.2	100
Second-class concrete cu. yds.	14,283	3,660	9,944	25.6	69.6
Third-class concrete cu. yds.	2,058	518	998	25.2	48.5
Reinforced concrete cu. yds.	550	80	512	14.5	93
First-class masonry coping cu. yds.	10	4	6.57	4.9	65.7
Wash wall cu. yds.	52,656	10,871	12,725	20.6	24.2
Second-class stone paving sq. yds.	685	76	485	11.1	71
Third-class stone paving sq. yds.	1,292	754	754	58.3	58.3
Cast iron culvert pipe lbs.	449,310	73,765	125,292	16.4	27.9
Structural steel lbs.	683,300	100,087	658,241	14.7	100
Metal reinforcement lbs.	55,600	6,814	47,704	12.3	84.6
4-in. wood pavement sq. yds.	340	0	333	0	100
3-in. wood pavement sq. yds.	1,200	263	1,155	21.9	100
Wood fence lin. ft.	8,940	2,358	3,775	26.3	42.2
Wrought iron pipe railing lin. ft.	30	0	26	0	100
Lattice railing lin. ft.	640	0	632	0	100
Drilling bolt holes in old masonry lin. ft.	650	0	200	0	30.8
Maintaining navigation lump sum	$8,250	$1,897 50	$3,795	23	46
Maintaining highway traffic lump sum	$3,000	$690	$1,380	23	46
Gross estimate	$821,033	$200,403	$374,252	24.3	45.6

"*Contract No.* 67. For the construction of the canal prism with two locks and other structures at Lockport, extending from the west end of contract No. 66 to the east end of contract No. 40, length 0.57 mile. Contract was awarded to Larkin & Sangster on September 3, 1910.

"The contract line is monumented and about 90 per cent of appropriation surveys completed. Contractors have opened an office in the Ashley Building and steam-shovel plant has arrived. Work will begin early in October.

"*Contract No.* 40. This contract extends from the west end of contract No. 67 in the city of Lockport to Sulphur Springs guard-lock at Pendleton, where it adjoins contract No. 19. Length of the contract, 4.84 miles. It has been under construction by the United Engineering and Contracting Co., of New York, since March, 1909. Work is to be completed on December 1, 1911. Edward Anderberg is the Assistant Engineer in charge.

" The total amount of work done to date is 34.7 per cent of the whole contract. Of this 28.4 per cent was done during the past year, and the work consisted mainly of excavation and channeling.

" At Hinman road an electrically operated compressor station supplies air which was piped along the contract for the purpose of operating drills, pumps, two cableways and scraper buckets.

" Up to the close of navigation, on November 15, 1909, the units of plant were as follows: Drills, steam-shovel, two trains; drills, steam-shovel and two locomotive cranes; drills, steam-shovel and tipple; two Hammond scraper buckets operated with hoisting engine and "A" frames; one steam derrick in connection with drills and hand labor; 420-foot cantilever with scraper bucket outfit, doing its own excavating and conveying.

" At the close of navigation, the canal was drained, and in addition to the above plant the following units were installed: Drills, steam-shovel and double-boom crane; drills, steam-shovel and cableway at the guard-lock; two wooden derricks and drills operated in connection with excavation by hand; two steel derricks similarly operated. During part of the winter a small Vulcan steam-shovel replaced the two Hammond scraper bucket outfits. Through the period of closed navigation, eight to ten channeling machines were operated; the remainder of the year five were used. The highest monthly estimate for channeling was in January, when 22,058 sq. ft. were cut.

" On Monday, August 1, 1910, the large cantilever collapsed, on account of the failure of one of the main tie members at the foot of the supporting towers. The resulting damage necessitated rebuilding about one-half of the machine, which resumed operation September 25, 1910. No personal injury was sustained in the accident. During the year this machine excavated 347,264 cu. yds. of earth, in about nine full working months, or an average of 38,585 cu. yds. per month. The maximum monthly estimate was 54,769 cu. yds. — in May, 1910. Operating time is three shifts per day. This machine will average, except under abnormal conditions, nearly 70 cu. yds. per hour, through the month.

" The unit comprised of steam-shovel and double-boom crane excavated 125,150 cu. yds.— working through a period of nine working months, or an average of 13,905 cu. yds. per month. This machine was operated at different times on single, double and triple eight-hour shifts. The highest output was in April, 1910, the machine operating partly on triple and partly on double eight-hour shifts, and was 23,766 cu. yds., of which about one-third was rock. The output in March, 1910, was 20,825 cu. yds. all rock, on which the machine worked three eight-hour shifts through the month.

" It is the intention to build the structures on the contract during the coming winter.

" A new unit, consisting of cantilever conveyor and Browning crane with Page bucket, will be installed to work at the west end of section covered by large cantilever.

" No adverse criticism can be made of the equipment on this contract, as the quality and arrangement of plant shows a comprehensive and conscientious study. The indications at present are that the contract will be completed within the time limit.

" The following table summarizes the work to date:

ITEMS OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Coffer-dams, etc lump sum	$10,000	$1,000	$1,000	10	10
Clearing lump sum	$2,000	$900	$1,500	45	75
Excavation cu. yds.	2,341,905	758,514	931,929	32.4	39.8
Channeling sq. ft.	430,550	97,010	97,010	22.5	22.5
Forming embankment cu. yds.	31,690	1,188	1,188	3.7	3.7
Second-class concrete cu. yds.	7,419	62	62	0.8	0.8
Third-class concrete cu. yds.	519	163.9	163.9	31.6	31.6
Reinforced concrete cu. yds.	554	7.6	7.6	1.4	1.4
Wash wall cu. yds.	38,508	318	318	0.8	0.8
Metal reinforcement lbs.	70,840	3,009	3,009	4.2	4.2
Maintaining navigation lump sum	$5,000	$1,500	$1,500	30	30
Ditch excavation cu. yds.	38,520	19,648	19,648	51	51
Gross estimate	$2,190,870	$623,988	$759,852	28.5	34.7

ERIE CANAL, RESIDENCY NO. 11.

Resident Engineer C. J. McDonough reports:

"This residency extends from Sulphur Springs guard-lock, in the town of Pendleton, to and through the city of Buffalo.

" Inasmuch as the Barge canal will join the Niagara river at Tonawanda, the work of the State of New York ends at that point. Between Tonawanda and Buffalo, a distance of about eleven miles, the work of excavating a ship channel, 23 feet deep and 400 feet wide, will be completed by the United States government. An additional appropriation of $800,000, which will be available during the coming year, will be sufficient for this purpose. A lock at Buffalo, 875 feet long, is now under construction and will be completed in 1912.

"Two Barge canal contracts are embraced in this residency, namely, contract No. 19 and a contract about 2,500 feet long from Delaware avenue bridge, Tonawanda, to Niagara river, which has not yet been advertised.

"*Contract No.* 19. This contract extends from the Pendleton guard-lock to the Delaware avenue bridge, Tonawanda, a distance of 12.46 miles. Work was begun May 25, 1907, by the Great Lakes Construction Co. of Buffalo, N. Y., and the contract was to be completed December 31, 1910. O. L. Burdett is the Assistant Engineer in charge.

"This contract is mainly excavation, and during the past year 1,091,231 cu. yds. were excavated. The hydraulic dredge *Niagara* removed 994,548 cu. yds. of the above in nine working months, or an average of 110,500 cu. yds. per month. This machine was operated on triple-shift and discharged material into spoil banks between dykes made by two Page bucket machines, which were exclusively used for that purpose. The dipper-dredge *Buffalo* was employed all the year excavating in places where hard-pan was encountered. The material was dumped at various places along Tonawanda creek, to be later excavated by the hydraulic dredge.

"Bush's bridge was completed during the month of November, 1909, having been partly built at the time of the last report.

"The new concrete dock at Tonawanda is completed, except about 30 feet at the Ellicott creek bridge, where it was impossible to drain the coffer-dam on account of the porosity of the underlying material.

"During the winter of 1909-10 an earth dam was constructed at Pendleton and excavation was made 'in the dry' by means of steam drills, hand labor, cars on inclines, operated by hoisting engines, and cableway. Early in March an abnormal flood occurred and water rose above the dam and this part of the work was abandoned for the season. This work will be resumed on the same plan as soon as navigation closes; and the rock on the contract will be excavated.

"The two spans of Pickard's bridge will be transposed during the winter and the necessary changes of abutments and pier made.

"The following table shows the condition of the work up to October 1, 1910:

ITEMS OF WORK.	Preliminary estimate.	Work done during year.	Total work done to date.	Per cent of work done during year.	Per cent of work done to date.
Excavation, guard-lock to sta. 6180.....cu. yds.	240,000	20,239	150,231	8.4	62.6
Excavation, sta. 6180 to Tonawanda....cu. yds.	3,217,000	1,070,992	1,899,980	33.3	59.1
Sheeting and bracing..................ft. B. M.	974,000	304,449	1,034,795	31.2	100
Embankment...........................cu. yds.	36,000	16,597	21,489	46.1	59.7
Lining...............................cu. yds.	2,200	225	235	10.2	10.7
Sawed lumber, yellow pine............ft. B. M.	24,000	20,715	20,715	86.3	86.3
Sawed lumber, hemlock................ft. B. M.	40,000	13,818	13,818	34.5	34.5
Round timber.........................lin. ft.	16,000	3,530	17,714	22.1	100
Stone filling in cribs...............cu. yds.	850	185	185	21.7	21.7
Foundation piles, 20 ft. long..............No.	340	0	46	0	13.5
Second-class gravel concrete.........cu. yds.	15,900	4,705	12,225	29.6	76.9
Reinforced concrete..................cu. yds.	400	0	144	0	36
Metal reinforcement.......................lbs.	45,770	0	15,843	0	34.7
Masonry coping.......................cu. yds.	6	3	3	50	50
Cobblestone paving...................sq. yds.	95	0	62	0	65.3
Structural steel..........................lbs.	255,790	27,470	243,960	10.8	95.4
Removing bridge superstructures......lump sum	$359	0	$179 50	0	50
Maintaining traffic..................lump sum	$599	$173 71	$353 41	29	59
Gross estimate..............................	$891,401	$238,756	$550,063	26.9	61.7

CONCLUSION.

A statement of the engineering expenses of the division and tables of contracts completed during the fiscal year and those in force at its close, are hereto appended.

The engineering force has consisted of an average of about 150 men. The entire organization has rendered valuable assistance and I desire to express my appreciation of their efficient and conscientious service.

I desire also to thank you and your Deputies for the valuable suggestions and hearty coöperation, which has been of great assistance to me in the performance of my duties.

Respectfully submitted,

T. W. BARRALLY,
Division Engineer.

THE FOLLOWING STATEMENTS SHOW THE NAMES, RANK AND COMPENSATION OF ENGINEERS IN THE WESTERN DIVISION OF THE DEPARTMENT OF THE STATE ENGINEER AND SURVEYOR, TOGETHER WITH INCIDENTAL EXPENSES FOR THE FISCAL YEAR ENDED SEPTEMBER 30, 1910.

Ordinary Repairs to Canals — Erie Canal.

Chapter 432, Laws of 1909.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
T. W. Barrally	Division engineer	$300 00 per month	$900 00	....	$900 00
T. W. Barrally	Division engineer	350 00 per month	3,150 00	$12 65	3,162 65
J. G. Soergel	Financial clerk	5 00 per day	780 00	2 96	782 96
J. G. Soergel	Financial clerk	150 00 per month	900 00	14 41	914 41
A. B. Williams	Estimate clerk	150 00 per month	1,800 00	....	1,800 00
Anna M. Lorscheider	Stenographer	100 00 per month	1,200 00	....	1,200 00
M. E. Montgomery	Stenographer	75 00 per month	50 80	....	50 80
H. J. Hemstreet	Assistant engineer	6 00 per day	24 00	....	24 00
Frank V. Searls	Estimate clerk	126 00 per month	109 16	....	109 16
Tracy B. Smith	Draftsman	5 00 per day	145 00	160 58	305 58
C. J. Alber	Draftsman	4 00 per day	12 00	....	12 00
E. M. Faller	Axeman	2 00 per day	16 00	....	16 00
O. M. Punch	Laborer	2 00 per day	42 00	....	42 00
					$9,319 56

Incidental Expenses.

Stationery and printing	$24 95	
Office rent	360 00	
Telephone and telegraph	37 85	
Miscellaneous	462 17	
		884 97
Total		$10,201 53

Construction of Barge Canal — Erie Canal.

Chapter 147, Laws of 1903, and amendatory laws.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
T. W. Barrally	Division engineer	$350 00 per month	....	$716 29	$716 29
B. E. Failing	Resident engineer	225 00 per month	$2,025 00	127 30	2,152 30
O. F. Bellows	Resident engineer	225 00 per month	2,025 00	90 16	2,115 16
Thos. J. Morrison	Resident engineer	225 00 per month	2 025 00	73 91	2 098 91
Chas. A. Ingersoll	Resident engineer	225 00 per month	2 025 00	358 29	2,383 29
B. E. Failing	Resident engineer	200 00 per month	600 00	13 85	613 85
O. F. Bellows	Resident engineer	200 00 per month	600 00	65 37	665 37
Thos. J. Morrison	Resident engineer	200 00 per month	600 00	25 36	625 36
Chas. A. Ingersoll	Resident engineer	200 00 per month	600 00	181 08	781 08
C. J. McDonough	Resident engineer	200 00 per month	1,200 00	80 93	1,280 93
Jacob G. Soergel	Financial clerk	150 00 per month	....	12 99	12 99
F. V. Searls	Estimate clerk	126 00 per month	1,276 94	153 63	1,430 57
M. Abramson	Junior clerk	60 00 per month	427 74	....	427 74
A. Edith Schoelles	Stenographer	50 00 per month	369 61	....	369 64
Chas. R. Zorach	Draftsman	5 00 per day	525 00	3 22	528 22
Geo. C. Britton	Draftsman	5 00 per day	1,050 00	....	1,050 00
C. E. Elmendorf	Draftsman	5 00 per day	1,040 00	....	1,040 00
H. Clyde Roe	Draftsman	5 00 per day	785 00	....	785 00
H. H. Stickney, Jr	Draftsman	5 00 per day	405 00	30 70	435 70
C. R. Waters	Draftsman	5 00 per day	385 00	....	385 00
A. B. Chappell	Draftsman	5 00 per day	1,170 00	....	1,170 00

Construction of Barge Canal — Erie Canal — (Continued).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
C. J. Alber	Draftsman	$5 00 per day	$655 00	....	$655 00
Tracy B. Smith	Draftsman	5 00 per day	1,217 50	$2 05	1,219 55
Chas. R. Zorsch	Draftsman	4 50 per day	918 00	79	918 79
Wm. H. Dernell	Draftsman	4 50 per day	1,422 00	....	1,422 00
C. R. Waters	Draftsman	4 50 per day	355 50	....	355 50
Geo. C. Britton	Draftsman	4 00 per day	420 00	....	420 00
C. E. Elmendorf	Draftsman	4 00 per day	420 00	....	420 00
H. Clyde Roe	Draftsman	4 00 per day	624 00	....	624 00
H. H. Stickney, Jr	Draftsman	4 00 per day	940 00	91 01	1,031 01
A. B. Chappell	Draftsman	4 00 per day	316 00	....	316 00
J. V. Hogan	Draftsman	4 00 per day	208 00	....	208 00
B. C. Lechler	Draftsman	4 00 per day	208 00	....	208 00
C. J. Alber	Draftsman	4 00 per day	716 00	....	716 00
Harry M. Nelson	Draftsman	4 00 per day	208 00	....	208 00
Clark D. Sniggs	Draftsman	4 00 per day	40 00	....	40 00
Percy L. Arnold	Draftsman	120 00 per month	240 00	....	240 00
Percy L. Arnold	Draftsman	100 08 per month	582 61	....	582 61
W. J. Burns	Tracer	75 00 per month	900 00	14 81	914 81
John B. Doyle	Tracer	75 00 per month	525 00	....	525 00
R. J. Curran	Tracer	75 00 per month	895 16	....	895 16
Jas. G. Allan	Tracer	75 00 per month	75 00	....	75 00
Jas. G. Allan	Tracer	50 00 per month	250 00	4 58	254 58
Chas. Montag	Tracer	50 00 per month	150 00	....	150 00
C. J. McDonough	First assistant engineer	7 00 per day	1,099 00	55 95	1,154 95
F. J. Wilbur	Assistant engineer	6 00 per day	1,884 00	1 79	1,885 79
J. S. Summers	Assistant engineer	6 00 per day	1,890 00	492 59	2,382 59
Elmer C. Lawton	Assistant engineer	6 00 per day	612 00	15 46	627 46
E. P. Strowger	Assistant engineer	6 00 per day	1,566 00	13 40	1,579 40
Frank T. Marsh	Assistant engineer	6 00 per day	1,878 00	56 49	1,934 49
L. G. Fisher	Assistant engineer	6 00 per day	1,878 00	68 23	1,946 23
H. R. Wickham	Assistant engineer	6 00 per day	1,890 00	45 78	1,935 78
H. J. Hemstreet	Assistant engineer	6 00 per day	1,794 00	94 11	1,888 11
B. L. G. Rees	Assistant engineer	6 00 per day	1,566 00	102 17	1,668 17
G. M. Briggs	Assistant engineer	6 00 per day	1,308 00	95 09	1,403 09
C. L. Henderson	Assistant engineer	6 00 per day	432 00	92 86	524 86
A. S. Milinowski	Assistant engineer	6 00 per day	1,878 00	176 10	2,054 10
R. H. Merrill	Assistant engineer	6 00 per day	1,872 00	320 62	2,192 62
Arthur S. Whitbeck	Assistant engineer	6 00 per day	1,842 00	389 95	2,231 95
Geo. D. Kellogg	Assistant engineer	6 00 per day	630 00	249 20	879 20
Edward Anderberg	Assistant engineer	6 00 per day	1,878 00	294 31	2,172 31
Elias H. Anderson	Assistant engineer	6 00 per day	1,884 00	257 59	2,141 59
Alfred S. Mirick	Assistant engineer	6 00 per day	306 00	12 88	318 88
D. E. Bellows	Assistant engineer	6 00 per day	924 00	31 57	955 57
B. L. G. Rees	Assistant engineer	5 00 per day	230 00	10 25	240 25
G. M. Briggs	Assistant engineer	5 00 per day	260 00	54 32	314 32
C. L. Henderson	Assistant engineer	5 00 per day	665 00	81 65	746 65
Geo. D. Kellogg	Assistant engineer	5 00 per day	1,040 00	179 52	1,219 52
O. L. Burdett	Assistant engineer	5 00 per day	1,565 00	354 15	1,919 15
J. V. Hogan	Assistant engineer	5 00 per day	425 00	29 78	454 78
Harold N. Metzger	Leveler	5 00 per day	1,305 00	102 60	1,407 60
Francis W. Madigan	Leveler	5 00 per day	1,565 00	93 01	1,658 01
J. B. Barrett	Leveler	5 00 per day	1,565 00	....	1,565 00
C. L. Baldwin	Leveler	5 00 per day	930 00	138 23	1,068 23
G. Edson	Leveler	5 00 per day	1,565 00	....	1,565 00
L. R. Barnes	Leveler	5 00 per day	1,565 00	....	1,565 00
Raymond Sickles	Leveler	5 00 per day	1,565 00	....	1,565 00
Wm. T. Huber	Leveler	5 00 per day	1,565 00	....	1,565 00
C. R. Waters	Leveler	5 00 per day	785 00	....	785 00
Harold N. Metzger	Leveler	4 50 per day	234 00	....	234 00
Geo. S. Haight	Leveler	4 50 per day	1,431 00	65 51	1,496 51
C. L. Baldwin	Leveler	4 50 per day	589 50	....	589 50
J. V. Hogan	Leveler	4 50 per day	796 50	26 03	822 53
B. C. Lechler	Leveler	4 50 per day	121 50	....	121 50
Harry M. Nelson	Leveler	4 50 per day	1,206 00	3 92	1,209 92
C. J. Bean	Leveler	4 50 per day	1,192 50	....	1,192 50
Alfred E. Roche	Leveler	4 50 per day	715 50	59 72	775 22
A. P. Mussi	Leveler	4 50 per day	355 50	4 58	360 08
H. J. Simmelink	Leveler	4 50 per day	153 00	....	153 00
R. C. Georger	Leveler	4 50 per day	117 00	....	117 00
M. F. Dullea	Rodman	4 00 per day	1,260 00	....	1,260 00
H. J. Simmelink	Rodman	4 00 per day	1,016 00	....	1,016 00
J. W. Howe	Rodman	4 00 per day	1,252 00	....	1,252 00

Construction of Barge Canal — Erie Canal — (Continued).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
A. O. Peabody	Rodman	$4 00 per day	$524 00	$9 88	$533 88
E. D. Bean	Rodman	4 00 per day	1,284 00	[illegible]	1,284 80
C. J. Bean	Rodman	4 00 per day	208 00		208 00
Walter G. Dubey	Rodman	4 00 per day	1,167 00		1,167 00
Harold R. Holmes	Rodman	3 50 per day	784 00		784 00
M. Glassberg	Rodman	3 50 per day	674 00		674 00
John B Doyle	Rodman	3 50 per day	458 50		458 50
Dana M. Miner	Rodman	3 50 per day	549 50		549 50
W. H .Ginnity	Rodman	3 50 per day	1,017 00		1,017 00
H. J. Simmelink	Rodman	3 50 per day	91 00		91 00
J. J. Hynes	Rodman	3 50 per day	276 50		276 50
A. O. Peabody	Rodman	3 50 per day	637 00		637 00
R. C. Georger	Rodman	3 50 per day	1,017 50		1,017 50
H. F. Bronson	Rodman	3 50 per day	276 50		276 50
Fred C. Facer	Rodman	3 50 per day	549 50		549 50
Bruce L. Hall	Rodman	3 50 per day	332 50	2 79	335 29
W. J. Willis	Rodman	3 50 per day	45 50		45 50
E. J. Greiner	Chainman	3 00 per day	939 00		939 00
D. T. Simpson	Chainman	3 00 per day	939 00		939 00
D. M. Miner	Chainman	3 00 per day	468 00		468 00
J. F. Webster	Chainman	3 00 per day	159 00		159 00
Fred C. Facer	Chainman	2 50 per day	390 00		390 00
W. J. Ryan	Chainman	2 50 per day	22 50		22 50
Thos. E. McGrath	Chainman	2 50 per day	782 50		782 50
Fred C. Davis	Chainman	2 50 per day	100 00		100 00
S. Covner	Chainman	2 50 per day	110 00		110 00
A. F. Truex	Chainman	2 50 per day	100 00		100 00
J. F. Webster	Chainman	2 50 per day	650 00		650 00
James M. Wilson	Chainman	2 50 per day	792 50		792 50
W. N. Langworthy	Chainman	2 50 per day	502 50		502 50
L. H. Brandt	Chainman	2 50 per day	387 50		387 50
H. J. O'Connor	Chainman	2 50 per day	390 00	4 75	394 75
R. A. Gross	Chainman	2 50 per day	90 00		90 00
S. A. Miller	Chainman	2 50 per day	320 00		320 00
C. N. Budlong	Chainman	2 50 per day	320 00		320 00
M. Abramson	Chainman	2 50 per day	320 00		320 00
L. V. Dunham	Chainman	2 50 per day	262 50		262 50
H. A. Ingersoll	Chainman	2 50 per day	320 00		320 00
A. W. Balliett	Chainman	2 50 per day	322 50		322 50
H. F. Hughes	Inspector	5 00 per day	1,705 00	464 57	2,169 57
W. W. Barclay	Inspector	5 00 per day	1,410 00		1,410 00
E. V. Allendorph	Inspector	5 00 per day	685 00		685 00
Geo. M. Harrar	Inspector	4 50 per day	238 50		238 50
C. M. Leet	Inspector	4 50 per day	1,062 00		1,062 00
E. L. Wick	Inspector	4 00 per day	1,252 00		1,252 00
Thos. McMorrow	Inspector	4 00 per day	1,296 00		1,296 00
Geo. M. Harrar	Inspector	4 00 per day	1,068 00		1,068 00
A. W. Gillis	Inspector	3 50 per day	154 00		154 00
Fred H. Palmer	Foreman of borings	4 00 per day	212 00		212 00
Thos. B. Bowes	Foreman of borings	4 00 per day	216 00		216 00
Fred H. Palmer	Foreman of borings	3 50 per day	808 50	121 00	929 50
Thos. B. Bowes	Foreman of borings	3 50 per day	948 50	17 40	965 90
Floyd C. Oatman	Boatman	3 00 per day	639 00		639 00
D. S. Hollenbeck	Boatman	3 00 per day	951 00		951 00
O. J. Townsend	Boatman	3 00 per day	489 00		489 00
Wm. F. Guenther	Boatman	3 00 per day	630 00		630 00
A. E. Williams	Axeman	2 00 per day	626 00		626 00
Geo. Seemueller	Axeman	2 00 per day	158 00		158 00
Finla L. Jones	Axeman	2 00 per day	672 00		672 00
Fred C. Davis	Axeman	2 00 per day	62 00		62 00
Frank N. Sisson	Axeman	2 00 per day	652 00		652 00
J. J. Sullivan	Axeman	2 00 per day	626 00		626 00
S. A. Miller	Axeman	2 00 per day	370 00		370 00
W. I. Ryan	Axeman	2 00 per day	34 00		34 00
F. G. Hempel	Axeman	2 00 per day	626 00		626 00
L. H. Brandt	Axeman	2 00 per day	316 00		316 00
F. J. O'Connor	Axeman	2 00 per day	626 00		626 00
C. F. Doty	Axeman	2 00 per day	52 00		52 00
H. J. O'Connor	Axeman	2 00 per day	316 00		316 00
F. G. Kimball	Axeman	2 00 per day	630 00		630 00
H. A. Shafer	Axeman	2 00 per day	626 00		626 00
E. J. Trimble	Axeman	2 00 per day	634 00		634 00

Construction of Barge Canal — Erie Canal — (Continued).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
T. Beaupre	Axeman	$2 00 per day	$626 00		$626 00
P. M. Howe	Axeman	2 00 per day	626 00		626 00
Wm. F. Lysett	Axeman	2 00 per day	474 00		474 00
Chas. J. Donaher	Axeman	2 00 per day	638 00		638 00
Wm. H. Barhyte	Axeman	2 00 per day	632 00		632 00
Geo. E. Merry	Axeman	2 00 per day	632 00		632 00
John A. Kelly	Axeman	2 00 per day	392 00		392 00
H. A. Ingersoll	Axeman	2 00 per day	370 00		370 00
E. M. Faller	Axeman	2 00 per day	356 00		356 00
A. W. Balliett	Axeman	2 00 per day	380 00		380 00
Thos. E. Plunkett	Axeman	2 00 per day	104 00		104 00
Burt C. Hayes	Axeman	2 00 per day	128 00		128 00
Lynn H. Barrows	Axeman	2 00 per day	614 00		614 00
Leo. J. Creighton	Axeman	2 00 per day	342 00		342 00
R. A. Gross	Axeman	2 00 per day	316 00		316 00
Henry Engler	Laborer	2 00 per day	630 00		630 00
L. V. Dunham	Laborer	2 00 per day	294 00		294 00
Wm. H. Saunders	Laborer	2 00 per day	676 00		676 00
Walter Myers	Laborer	2 00 per day	74 00		74 00
Steve Childs	Laborer	2 00 per day	76 00		76 00
William Marshall	Laborer	2 00 per day	94 00		94 00
Joseph Darcey	Laborer	2 00 per day	190 00		190 00
Edw. L. Kropp	Laborer	2 00 per day	286 00		286 00
W. M. Whitney	Laborer	2 00 per day	96 00		96 00
E. A. Brooks	Laborer	2 00 per day	94 00		94 00
James Gleason	Laborer	2 00 per day	176 00		176 00
Fred Smith	Laborer	2 00 per day	158 00		158 00
Carl Oelkers	Laborer	2 00 per day	176 00		176 00
Nick Gallo	Laborer	2 00 per day	5 00		5 00
David H. Mann, Jr	Laborer	2 00 per day	104 00		104 00
Martin Courneen	Laborer	2 00 per day	176 00		176 00
Frank Covert	Laborer	2 00 per day	176 00		176 00
Albert Keesler	Laborer	2 00 per day	176 00		176 00
John Halpin	Laborer	2 00 per day	158 00		158 00
Nelson Stevens	Laborer	2 00 per day	176 00		176 00
A. D. Hawley	Laborer	2 00 per day	306 00		306 00
W. J. Ryan	Laborer	2 00 per day	192 00	$6 10	198 10
C. T. Smith	Laborer	2 00 per day	314 00		314 00
Fred Petrie	Laborer	2 00 per day	176 00		176 00
William Childs	Laborer	2 00 per day	94 00		94 00
Claude A. Facer	Laborer	2 00 per day	94 00		94 00
C. L. Foster	Laborer	2 00 per day	286 00		286 00
A. A. Watraus	Laborer	2 00 per day	178 00		178 00
A. J. Childs	Laborer	2 00 per day	156 00		156 00
Thos. Dunn, Jr	Laborer	2 00 per day	158 00		158 00
W. B. Green	Laborer	2 00 per day	626 00		626 00
C. N. Budlong	Laborer	2 00 per day	370 00		370 00
Fred C. Davis	Laborer	2 00 per day	288 00		288 00
A. W. Beale	Laborer	2 00 per day	126 00		126 00
F. C. Jordan	Laborer	2 00 per day	82 00		82 00
C. F. Doty	Laborer	2 00 per day	574 00		574 00
A. F. Truex	Laborer	2 00 per day	536 00		536 00
C. Kumro	Laborer	2 00 per day	442 00		442 00
E. W. Horswell	Laborer	2 00 per day	640 00		640 00
O. M. Punch	Laborer	2 00 per day	494 00		494 00
J. B. Roberts	Laborer	2 00 per day	628 00		628 00
J. H. Madigan	Laborer	2 00 per day	550 00		550 00
Peter Arnold	Laborer	2 00 per day	634 00		634 00
Louis J. Mayne	Laborer	2 00 per day	194 00		194 00
Horace Stewart	Laborer	2 00 per day	342 00		342 00
Michael Unger	Laborer	2 00 per day	630 00		630 00
Duane M. Ward	Laborer	2 00 per day	158 00		158 00
Leo. G. Cooley	Laborer	2 00 per day	610 00		610 00
James D. Boucher	Laborer	2 00 per day	362 00		362 00
Fred C. Babcock	Laborer	2 00 per day	10 00		10 00
O. J. Townsend	Laborer	2 00 per day	300 00		300 00
Floyd C. Oatman	Laborer	2 00 per day	214 00		214 00
Wm. F. Guenther	Laborer	2 00 per day	180 00		180 00
M. S. Steinfeld	Laborer	2 00 per day	14 00		14 00
E. J. Bullis	Laborer	2 00 per day	184 00		184 00
H. Case Wilcox	Laborer	2 00 per day	220 00		220 00
Edw. Fitzgerald	Gage reader	7 00 per month	10 61		10 61
Jacob Snell, Jr	Gage reader	6 00 per month	72 00		72 00
Wm. J. Swarts	Gage reader	5 00 per month	60 00		60 00

Construction of Barge Canal — Erie Canal — (Concluded).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
Carl Tuscher	Gage reader	$5 00 per month	$60 00		$60 00
C. Henry Harrison	Gage reader	5 00 per month	60 00		60 00
Martin Hunkley	Gage reader	5 00 per month	60 00		60 00
P. J. Slavin	Gage reader	5 00 per month	60 00		60 00
					$155,228 33
Incidental Expenses.					
Instruments, tools and appliances				$258 97	
Office rent				3,334 37	
Fuel and light				361 89	
Stationery and printing				433 05	
Postage				297 22	
Telephone and telegraph				1,142 82	
Miscellaneous				10,248 35	
					16,792 26
Total					$172,020 59

Allen Street Bridge, Rochester.

Chapter 291, Laws of 1908.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
E. P. Strowger	Assistant engineer	$5 00 per day	$140 00		$140 00
E. P. Strowger	Assistant engineer	6 00 per day	174 00		174 00
Tracy B. Smith	Draftsman	5 00 per day	132 50		132 50
					$446 50
Incidental Expenses.					
Postage				$0 07	
Miscellaneous				1 00	
					1 07
Total					$447 57

Georgia Street Bridge, Buffalo.

Chapter 452, Laws of 1909

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
A. G. Hayden	Bridge designer		$57 29		$57 29
Harold Levy	Bridge designer		56 45		56 45
J. M. C. Quarles-de Quarles	Bridge designer		42 00		42 00
J. Malcolm Angus	Bridge draftsman		11 13		11 13
Leo. Freitag	Bridge draftsman		41 94		41 94
John F. Blaisie	Junior bridge draftsman		7 26		7 26
Chas. E. Quimby	Junior bridge draftsman		8 04		8 04
F. V. Searls	Estimate clerk	$126 00 per month	121 40	$101 15	222 55
Tracy B. Smith	Draftsman	5 00 per day	25 00	60 29	85 29
C. J. Alber	Draftsman	4 00 per day	8 00		8 00
J. L. Southworth	Engineering draftsman		24 00		24 00
Bernard Gasier	Tracer		17 10		17 10

Georgia Street Bridge, Buffalo — (Continued).

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
H. J. Hemstreet	Assistant engineer	$6 00 per day	$54 00	$25 92	$79 92
W. G. Dubey	Rodman	4 00 per day	76 00	85	76 85
E. M. Faller	Axeman	2 00 per day	8 00		8 00
O. M. Punch	Laborer	2 00 per day	10 00		10 00
					$755 82
Incidental Expenses.					
Stationery and printing				$64 96	
Postage				02	
Miscellaneous				160 02	
					225 00
Total					$980 82

Surveys for State Court of Claims.

Chapter 578, Laws of 1907.

NAME.	Rank.	Rate of compensation.	Services.	Travel.	Total.
A. S. Whitbeck	Assistant engineer	$6 00 per day	$60 00	$15 72	$75 72
R. H. Merrill	Assistant engineer	6 00 per day	48 00	12 70	60 70
B. L. G. Rees	Assistant engineer	6 00 per day	30 00	70	30 70
Tracy B. Smith	Draftsman	5 00 per day	35 00	3 85	38 85
Chas. R. Zorsch	Draftsman	4 50 per day	18 00	17 55	35 55
A. W. Gillis	Masonry inspector	3 50 per day	17 50		17 50
E. L. Wick	Masonry inspector	4 00 per day	12 00		12 00
					$271 02
Incidental Expenses.					
Miscellaneous				$0 80	
Total					$271 82

SUMMARY.

The foregoing tables are summarized as follows:

Ordinary Repairs to Canals.

1.	Erie canal, chapter 432, Laws of 1909	$10,204 53

Construction of Barge Canal.

2.	Erie canal, chapter 147, Laws of 1903; chapter 195, Laws of 1909	172,020 59

Special Work.

3.	Construction of Allen street bridge, Rochester, chapter 291, Laws of 1908	447 57
4.	Construction of Georgia street bridge, Buffalo, chapter 452, Laws of 1909	980 82

Special Surveys.

5.	Surveys for State Court of Claims, chapter 578, Laws of 1907	271 82
	Total	$183,925 33

TABLE OF CONTRACTS COMPLETED ON THE WESTERN DIVISION DURING THE FISCAL YEAR ENDED SEPTEMBER 30, 1910.

CONTRACTOR.	Date of contract.	Character of work.	ACT.		Contract price.	Final payment.
			Chapter.	Year.		
Wm. T. McKibbin Co.	Jan. 15, 1909	Allen street bridge, Rochester	291	1908	$26,708 40	$24,481 48

Construction of Barge Canal.

Chapter 147, Laws of 1903, and amendatory laws.

CONTRACTOR.	Date of contract.	Character of work.	Engineer's preliminary estimate.	Contract price, as affected by alterations.	Final payment.
Groton Bridge Company	Aug. 10, 1906	Contract No. 7, Erie canal — Bridges on Contract No. 6	$28,662 80	$27,302 45	$26,449 20
Henry Tosh & Son	Jan. 11, 1909	Contract No. 38, Erie canal — Wapping's bridge	20,131 25	16,869 90	16,286 67

TABLE OF CONTRACTS PENDING ON THE WESTERN DIVISION, SEPTEMBER 30, 1910.

CONTRACTOR.	Date of contract.	Character of work.	ACT.		Engineer's preliminary estimate.	Contract price.	Payments to September 30, 1910.
			Chapter.	Year.			
Lupfer & Remick	Jan. 29, 1910	Georgia street bridge, Buffalo	452	1909	$18,371 00	$18,121 00	$14,274 00

Construction of the Barge Canal.

Chapter 147, Laws of 1903, and amendatory laws.

CONTRACTOR.	Date of contract.	Character of work.	Engineer's preliminary estimate.	Contract price, as affected by alterations.	Payments to September 30, 1910.
Frank A. Maselli	May 3, 1905	Contract No. 6, Erie canal — Buffalo road, southwest of Rochester, to near South Greece	$1,381,661 00	$1,026,549 80	$982,350 00
Thos. Crimmins Contracting Co	Mar. 18, 1908	Contract No. 9, Erie canal — Eagle Harbor to Beal's bridge	724,014 00	755,995 00	600,060 00
Great Lakes Construction Co	Nov. 26, 1906	Contract No. 19, Erie canal — Sulphur Springs guard-lock to Ellicott creek	1,038,245 00	891,400 91	550,060 00
Lane Bros. Company	April 17, 1910	Contract No. 21, Erie canal — Genesee river to near N. Y. C. bridge	1,475,900 00	1,323,150 00	141,730 00
Millard & Lupton Co	Aug. 18, 1909	Contract No. 23, Erie canal — Kings Bend to Genesee river	2,166,600 00	1,849,342 00	215,740 00
United Engineering & Contracting Co	Nov. 27, 1908	Contract No. 40, Erie canal — Locks at Lockport to Sulphur Springs guard-lock	2,516,743 00	2,190,870 30	759,850 00
Butler Bros. Construction Co	Dec. 5, 1908	Contract No. 41, Erie canal — Irondequoit creek crossing	383,190 00	281,330 00	233,760 00
Crowell-Sherman-Stalter Co	Nov. 30, 1908	Contract No. 47, Erie canal — Town of Galen to Lyons	1,434,148 00	1,273,071 35	553,650 00
Bellew & Merritt Co	Feb. 21, 1910	Contract No. 49, Erie canal — Palmyra to Wayne-Monroe county line	765,679 00	750,279 25	30,470 00

Empire Engineering Corporation	Aug. 6, 1908	Contract No. 60, Erie canal — Near South Greece to near Adams Basin	1,267,301 00	1,475,891 83	939,850 00
Cleveland & Sons Company	Oct. 13, 1908	Contract No. 61, Erie canal — Near Adams Basin to Monroe-Orleans county line	1,000,219 00	1,047,994 00	260,230 00
I. M. Ludington's Sons, Inc	Aug. 11, 1910	Contract No. 62, Erie canal — Monroe-Orleans county line to Eagle Harbor	2,151,470 00	2,347,836 00	....
H. S. Kerbaugh, Inc	June 3, 1910	Contract No. 63, Erie canal — Wayne-Monroe county line to Kings Bend	2,184,083 00	1,990,043 00	14,510 00
Empire Engineering Corporation	Aug. 6, 1908	Contract No. 64, Erie canal — Near Prospect street, Medina, to near Gasport	1,207,930 00	1,312,157 79	449,160 00
Empire Engineering Corporation	Sept. 22, 1908	Contract No. 66, Erie canal — Near Gasport to near locks at Lockport	751,039 00	821,032 72	374,250 00
Larkin & Sangster	Sept. 3, 1910	Contract No. 67, Erie canal — Locks at Lockport	1,290,880 00	1,149,401 25	....
Receivers of J. B. & J. M. Cornell Co	Mar. 1, 1910	Contract No. 75, Erie canal — Guard-gate superstructures on contracts Nos. 60, 61 and 64	39,525 00	42,917 00	....

Report of Tests

Report of the Land Bureau

Catalogue of Maps and Papers in the Land Bureau

REPORT OF TESTS.

TESTING LABORATORY — STATE HALL.

ALBANY, N. Y., *October* 1, 1910.

HON. FRANK M. WILLIAMS, *State Engineer and Surveyor:*

Sir.— I have the honor to submit the following report of the work of the testing laboratory of your Department for the fiscal year ended September 30, 1910.

The work of the year has been more than simply routine, and, besides the regular testing of cements, tests are now being made of sand as well as cements. Many special tests of considerable variety have made the work of particular interest and value, the most important of these being the special series of tests on concrete prisms and arches. The inspection of cement at the mills has greatly increased the work of the bureau.

CEMENT TESTS.

The routine work of testing cement has been large during the past year, because of the great amount of work being done upon the Barge canal and upon the public highways. The transfer of highway work to the Highway Commission resulted in the Commission placing the necessary number of men in this laboratory to make the tests on cement proposed for use on highways. The supervision of their work was left with the undersigned. The work done also includes, as for several years past, a large number of tests made for work under the direction of the State Architect. Although the laboratory has been enlarged several times, the work at times required the full capacity of the laboratory, especially when field work was in full swing during the summer months. The reports of tests made do not include those made by the representatives of the Department of Highways.

During the past year there have been submitted to this laboratory for tests 468 lots of cement samples, consisting of a total of

10,329 samples. These samples represented 519,906 barrels of cement, of which 92.1 per cent were for the Barge canal and 7.9 per cent were for the State Architect.

The inspection of cement at the mill permits the taking of a smaller proportion of samples to the number of barrels represented. The larger part of the work is through mill inspection, for the total number of barrels of cement tested, after having been sampled at the mills, was 476,464, and only 10,222 barrels were tested for the Barge canal after delivery upon the work.

Each sample submitted, mixed in the proportion of one part cement to three parts standard quartz sand, was tested for tensile strength at the ends of 7 and 28 days. In addition to the tests for tensile strength, each lot of samples was given tests for fineness and grinding, for initial and hard sets, for specific gravity and for soundness by means of the steam tests, the normal-water test and the normal-air test. Frequently the cements are completely analyzed and are especially checked for sulphuric anhydride (SO_3) and magnesia (MgO).

Of the cement tested all was Portland cement. The brands represented by the samples received are about the same as heretofore and consist of 22 American Portland cements. Of the brands, 6 were manufactured in New York, 13 in Pennsylvania, and 3 in New Jersey. 62.8 per cent of all cement tested was made in New York state.

During the year 97 series of special tests were made. For these about 1,550 briquettes were made. Among these were tests for the effect a heavy oil would have on a cement mortar and also a series for the effect of hydrated lime mixed with cement. The other tests include several short and long period tests.

A brief description of the method used in making the tests in this laboratory will probably make the results of the tests much better understood as well as more easily comparable with the results obtained in other testing laboratories. The method is practically the same as that recommended by the American Society of Civil Engineers. It is as follows:

Sampling.—After the cement proposed to be used upon any contract work of the State has been delivered and well stored, the engineer in charge, or his representative, takes one sample from every tenth barrel of cement or from the equivalent of the tenth barrel when packed in sacks. Each sample is placed in a double envelope-bag upon which is printed such matter as when filled in by the person taking the sample will give the sample number, brand of cement, date of sampling and work upon which the cement is to be used. About twenty ounces of cement are taken for each sample. The samples are packed firmly and dry in wooden boxes and are then sent by express to this laboratory. Upon receipt here a portion of every sample is taken and these portions are thoroughly mixed into a large general sample. From this mixed sample is taken the cement used in making the tests of fineness, setting qualities, soundness, specific gravity and analysis.

Fineness.— The tests for fineness consist of drying the sample and then weighing on a scale capable of weighing to one ten-thousandth part of a pound a certain amount of the cement. This is carefully sieved through standard sieves of 2,500 and 10,000 meshes to the square inch. The sieving is done by means of a mechanical sifter operated by electricity, but all tests are completed by hand sifting. The residue is weighed and the percentages thus obtained. Ninety-nine per cent of the cement must pass the 2,500-mesh sieve and 92 per cent must pass the 10,000-mesh sieve.

Setting qualities.— From the mixed sample enough is also taken to make a ball of paste for the mould of the Vicat apparatus and for 3 neat pats. This is mixed up into a paste of normal consistency by adding from 18 to 25 per cent, by weight, of water to Portland cements and from 28 to 33 per cent to natural cements. After being thoroughly troweled this paste is moulded into a ball and pressed into the inverted mould and the paste struck off even with the bottom of the mould. It is then turned over and the top struck off even. This is then placed in the moist-air cabinet and tested from time to time by the Vicat needle. To be accepted, Portland cement must not take an initial set in less than 30 minutes or natural cements in less than 20 minutes; Portland cements must not take a hard set in less than an hour or require more than 10 hours to get hard set; natural cements must not take a hard set in less than 30 minutes or require more than 3 hours. The time is estimated from the moment of adding the water to the cement.

Soundness.—That cement paste which is left from the above test is moulded into 3 pats on glass plates about 3 inches by 4 inches in size. These pats are about one-half inch thick in the center and are drawn out to thin edges. As soon as made, the neat pats are placed in a moist-air cabinet and allowed to take their set. When the pats have hardened for 24 hours one is put in the steam of water at 212 degrees Fahr. for 5 hours. This is the "accelerated" or "hot-water" test; and if the pat, after being in the steam for 5 hours, shows no sign of blowing or cracking, it is reported as "good." The other pats are given normal-air and water tests by being kept respectively in air and water maintained at from 60 to 70 degrees Fahr.

Tensile strength — Mortar.— For the tests for tensile strength, each sample is gaged separately with its proper proportion of standard crushed quartz sand, 1 part of cement to 3 parts of sand, parts by weight. As each sample is thus gaged it is put into a small pan and each is kept in the order of its number, so that the samples will not lose their identity. Each separate sample of cement and sand is thoroughly mixed dry and then from 9 to 11 per cent by weight of water is added to Portland cements and from 10 to 13½ per cent by weight to natural cements. The percentage used is such as will give a stiff mortar, which will show up water when the trowel is drawn heavily over it. This mortar is thoroughly troweled and is then put into the moulds.

Briquettes.— The mould, which is of brass and of the standard form recommended by the American Society of Civil Engineers, is first filled with loose mortar and this is carefully compacted by pressing down with the thumbs protected by rubber gloves. More loose mortar is placed in the mould and is pressed down as before. This makes about three-quarters inch of mortar in the mould, having been placed in about three-eighths-inch layers. The top layer is placed by striking a further addition of loose mortar with the back of the trowel. The briquette is then struck off even with the top of the mould. Two briquettes are made from each sample.

Treatment.—As soon as made, the briquettes are placed upon plates of glass and are placed in the moist-air cabinet, care being taken to keep them in their order, so as to still retain their identity. After the mortar has hardened, the briquettes are removed from the moulds and replaced in cabinet. Twenty-four hours after gaging they are marked with a number which is given to each briquette consecutively as each is made, and are immersed and kept in water maintained at a temperature of about 60 to 70 degrees Fahr.

Breaking. On the seventh day after gaging, the first test for tensile strength is given, and 21 days later, or on the 28th day after gaging, the second briquette of each sample is broken for tensile strength. Three improved Fairbanks cement testing machines are used to obtain these results. All the operations are so conducted that there is perfect uniformity in the treatment of all the samples.

Strength.—Portland cements, mixed as described, must show an average of at least 150 pounds per square inch in tensile strength in 7 days and an average of at least 240 pounds per square inch in 28 days. Natural cements, mixed as described, must show a tensile strength of an average of at least 40 pounds per square inch in 7 days and an average of at least 100 pounds per square inch in 28 days.

Neat briquettes.—Tests for tensile strength of neat briquettes are seldom made, as the practice of this Department is to place the greater dependance upon the mortar test. Whenever they are made, however, they are made and treated in a manner similar to that given mortar briquettes, excepting, of course, that a greater percentage of water is used — usually being about 1 per cent less than that used in gaging for the neat pats of that particular lot or brand. Neat briquettes of Portland cement, so made, must show an average of at least 500 pounds per square inch in tensile strength in 7 days; and neat briquettes of natural cement, similarly made, must show an average of at least 150 pounds per square inch in tensile strength in 7 days.

Analysis.— The method of analysis used in examination of cements is that recommended by the committee of the New York Section — Society for Chemical Industry.

Specific gravity.— The tests for specific gravity are made as suggested by the American Society of Civil Engineers — the Le Chatelier apparatus being used as recommended.

Acceptance.—At the end of the 7-day tests, all results obtained on tests of samples of cement proposed for use on Barge canal work are reported to Mr. William B. Landreth, Special Deputy State Engineer, and, if thought best, are held for the 28-day tests, the lots being accepted or rejected according as the results show that the cement passes or fails in the tests. The reports of all tests of cement for all other work (except Barge canal and highway work) are submitted to Mr. H. W. DeGraff, Deputy State Engineer. All reports of tests for the Highway Commission are made to the Engineer in charge of the Bureau of Research.

Our method of testing each sample separately for tensile strength has proven very satisfactory; in fact, by means of it, much poor cement has been discovered which would have stood the tests had all of the samples of the lot been blended. This method, however, makes necessary a larger equipment and a more complete system of operation than is necessary under the general method of testing a blended sample. The effort has been made to maintain as complete a laboratory with as little expense as possible; and it has been acknowledged that the laboratory and its results are so complete as to be placed by experts as being among the best in the country.

The specifications for cement follow closely those recommended by the American Society for Testing Materials — varying from them only in some minor details.

Mill inspection.— In addition to the regular method of sampling, as already described in this report, it has been found advisable to sample cement proposed for use on the Barge canal, at the various mills. When there is enough cement to warrant doing so, an inspector is sent to a cement mill to sample cement and inspect shipments. The method of carrying on this work is as follows: The inspector takes samples from the various parts of the bin; each sample is shipped to the Testing Laboratory at Albany by the same method as described and also is tested in the same way. The endeavor is to obtain from the sampling and the testing of these samples the " run of the product." As soon as the samples are taken the inspector places the bin of cement under the seal of this Department and the bin is so sealed that no cement can be added to or taken from it without the breaking of the seal. When the results of the tests have been secured, the reports are made in the usual way, and then, if the cement is accepted, the bin of cement is assigned to the contract which may have placed an order for the cement. When the contractor needs cement, the inspector at the mill breaks the seal on the bin, inspects the loading of the car or cars, seals these with the Department seal and then reseals the bin of cement. A notice of shipment is forwarded to the laboratory and the resident engineer in charge of the contract to which the cement has been assigned. When the car or cars arrive on the work, the seal of the Department must be broken by the resident engineer or his representative, otherwise the lot of cement must be sampled and tested in the usual way.

This work of inspection has added considerably to the work of the Testing Laboratory, as an average of five inspectors are continually at this work and it is all done through the laboratory.

SAND TESTS.

The importance of thorough examination and tests of the sands proposed for use on the Barge canal has been practically demonstrated. Sixty-five samples of sand and gravel have been tested along the lines of tests established during the previous year. These tests are as follows: The sands are examined under the miscroscope for those elements that give the sand its characteristics. The other tests are for voids, loam, fineness, or grading, and tensile strength with cement. The latter are made from the sand in its natural condition and also washed; and the cement is a "standard" cement, made by mixing together in the laboratory several brands of cement which run nearly alike in the regular tests. All tests for tensile strength cover at least 28 days, but many long-time tests are being carried.

The "testing of sand" also includes the testing and examination of eight substitutes for sand, such as screenings and iron ore tailings. Several extended tests of these latter materials have been made.

OTHER TESTS.

Many other tests besides those already reported have been made in the laboratory. Tests and examinations of loams, heavy earth, stone, water, wood preservatives, water-proofing and other miscellaneous materials have been made. Laboratory examinations have been aided by inspection upon the work, where questions concerning concrete and other materials have arisen.

One of the most important portions of the work this year was the making and testing of a series of arches, cubes and prisms. These were made to secure more reliable data concerning the use of concrete in arches and the results obtained were of great value in the consideration of the form of construction to be used in carrying the Barge canal over the gorge at Medina. These series of tests included the construction of three sets of arches — six arches being made in each set,— twelve concrete cubes, 44 plain and 9 reinforced prisms. For the arches a heavy reinforced concrete base was constructed. On this the arches were built. A complete report of these tests has been printed in the *Barge Canal Bulletin,* Series III, Nos. 2 and 6. The work of constructing and making these valuable arch tests was done by this Bureau of Testing. Some heavy apparatus was needed and from the completion of one arch test to the next test at least three days were needed for the placing of the apparatus. The tests of cubes and prisms were made at the Rensselaer Polytechnic Institute, Troy, N. Y., under our direction.

In conclusion it should be stated that not only has the work greatly increased, because of the extension of the field of work, but that all this increase has been taken care of with a smaller number of men than in the year previous.

Respectfully submitted,

RUSSELL S. GREENMAN,

Resident Engineer in charge of Tests.

Report of the Land Bureau of the State Engineer's Department.

ALBANY, *October* 1, 1910.

Hon. FRANK M. WILLIAMS, *State Engineer and Surveyor:*

Sir.— I have the honor to present herewith a report on the various matters pertaining to the Land Bureau of your Department for the fiscal year ended September 30, 1910.

The Commissioners of the Land Office have applications for grants of land under water which are referred to this Department for examination and report; as are also a large number ot miscellaneous matters relating to State lands. These matters require careful inspection and naturally consume a great deal of time.

The maps are examined to determine their correctness and proper form, both from an engineering standpoint and to insure their conformity to the rules and regulations of the Land Office. In some cases it is also necessary to visit and inspect the locations of the proposed grants to decide as to the advisability of making the grants on the lines of the application, or, if necessary, to have them modified. It is also at times deemed advisable to deny some of these applications on account of interference with navigation or with the rights of the public.

Some applications were contested or had remonstrances filed against them, and hearings have been necessary to determine the rights of the several interested parties and report the outcome to the Commissioners of the Land Office.

There have been made in this Department, for the use of the State Engineer and Surveyor and the Commissioners of the Land Office, maps showing the lands under water granted by the Commissioners adjacent to the shores of Albany, Columbia, Clinton, Dutchess, Erie, Greene, Jefferson, Kings, Nassau, Niagara, Onondaga, Orange, Otsego, Queens, Rensselaer, Richmond, Rockland, Suffolk, Ulster and Westchester counties. These maps are brought up to date and are of great value for reference in adjusting land grants.

Thirty-four applications for grants of land under water were considered by this Department during the year. Two were for commerce, one for railroad purposes and the remainder for restricted beneficial enjoyment. The lands were in the following counties: Dutchess, Erie, Jefferson, Kings, New York, Nassau, Putnam, Richmond, Rensselaer, Suffolk and Westchester.

The State Engineer and Surveyor has sold at public auction all of those unappropriated lands of the State which have been ordered to be sold by the Commissioners of the Land Office.

The records of the office show that there were held during the year seventeen public auctions, at which twenty-three parcels of land were sold. The sum of $18,534.62 was realized therefrom.

Of these lands fifteen parcels were acquired through the Comptroller's tax sales, six from foreclosure of loan mortgages and two from other sources. The lands are located in the following counties: Albany, Clinton, Essex, Kings, Monroe, Niagara, Richmond, Oneida, Rockland, Seneca, Tioga and Ulster.

There has been the usual amount of correspondence and answering of inquiries from surveyors, lawyers and others on matters pertaining to the original maps and descriptions of the Colonial and early State surveys filed in this office. The answering of such inquiries often requires much time and study, as there are frequently more than one survey of the same land made at different times by various surveyors, and none should be overlooked. These maps become more valuable as time passes; and as a large part of them are very old and describe lines of tracts of land which have become, in many instances, the boundaries of towns and counties, the value of those records become still greater.

For better preserving these records they have been rearranged, placed in bound volumes and indexed for convenience of reference. That it is the proper method for the care of these valuable papers, and that it affords greater facility for finding particular papers with the certainty that none have been overlooked, has already been fully demonstrated.

A catalogue of the maps and papers on file in this Bureau is appended to this report. In 1859 the Legislature published a catalogue of maps and surveys in the offices of several State officials, compiled by David E. E. Mix, which included a part of the appended list. Not since 1859 has anything of this character been issued.

Respectfully,

MERRITT PECKHAM, JR.,

Assistant Engineer in charge of Land Bureau.

CATALOGUE OF MAPS AND PAPERS IN THE LAND BUREAU OF THE STATE ENGINEER'S DEPARTMENT.

Compiled by Merritt Peckham, Jr., Assistant Engineer in charge of Land Bureau.

MISCELLANEOUS MAPS.

No.

1 Map of the North Tier of lots in the Massachusetts, or Boston Ten Townships, Cortland and Tompkins counties; surveyed by James Geddes.

2 Map of subdivision of STATE LANDS in Otsego county, lying on Crumhorn mountain; by B. Gilbert, 1813.

3 Map of unappropriated land in town of Fort Ann, Washington Co. Laid into 21 lots by S. D. Kellogg. June, 1815.

4 Map of lots in Fifth Ward, city of Albany, Arsenal lot. (Copy from an old map of John R. Bleecker.)

5 Map of two tracts of land in Warren county — TONGUE MOUNTAIN Tract, 52 lots, towns of Bolton and Hague; WARRENSBURG Tract, 22 lots, town of Warrensburg; by S. D. Kellogg, 1815.

6 Totten & Crossfield's Purchase — Township No. 42, Hamilton and Herkimer counties; also Township No. 43, Herkimer Co.; surveyed by John Richards, Jan. and Feb, 1816.

7 Map of the village of LEWISTON, Niagara Co.; by Lemuel Foster, 1816.

8 Plan of village of LEWISTON, Niagara Co.; 1798, by act of Legislature.

9 Map of water front, village of TROY, Rensselaer Co.; 1803, by John E. Van Alen.

10 Totten & Crossfield's Purchase, Township No. 23 and triangle adjacent, Hamilton county; January, 1817, by John Richards.

11 Unappropriated land in Essex county, called ROARING BROOK Tract; towns of Elizabethtown and Keene; by S. D. Kellogg, 1817.

12 Map of PUTNAM CREEK Tract, Essex county, town of Crown Point; October, 1818, by George Webster; also
BULWAGGA BAY Tract, Essex county, town of Moriah and Crown Point; October, 1818, by George Webster.

13 Map of the village of BLACK ROCK, Erie county; by Lemuel Foster, 1816.

14 Lands ceded by the St. Regis Indians, 1816-18, Franklin Co.; surveyed September, 1818, by Charles C. Brodhead.

15 Totten & Crossfield's Purchase, Township No. 6, Hamilton Co.; filed 1817.

16 Maps of forts Crown Point, Ticonderoga and Fort George; 1801, by George Webster, for the Regents of the University.

17 Map of SCHNEYDER'S Patent, called Mapletown, Rensselaer county, town of Hoosic and part in Vermont; by Alex. Colden.

No.	MISCELLANEOUS MAPS — Continued
18	Map of the Southwest tract in NEW STOCKBRIDGE, Madison county, purchased from Indians June, 1819; by C. C. Brodhead; also Map of the Northeast tract in NEW STOCKBRIDGE, Oneida county; purchased from Indians, July, 1819.
19	Map of three tracts of STATE LAND in town of Windsor, Broome county and adjacent tracts; by Wm. Macclure, 1819.
20	OLD MILITARY Tract, Townships 11 and 12, Essex Co., Thorn's survey; part by John Richards, 1812.
21	Part of FISH CREEK Reservation, Lots 1 to 12, purchased from Oneida Indians, Oneida county; 1796, by H. P. Schuyler.
22	Map of FISH CREEK lands belonging to the STATE, Oneida county; surveyed 1809, by Benjamin Wright.
23	Part of FISH CREEK Reservation, Lots 37 to 57 both sides, Oneida county; surveyed 1811, by Benjamin Wright.
24	Part of FISH CREEK Reservation, called Indian Meadows, reserved for Indians, Oneida county; August, 1820, by C. C. Brodhead.
25	Township of SOLON, Lots Nos. 9 and 73, Cortland county; escheated 1821.
26	Township of POMPEY, Lot No. 79, Onondaga county; 1821.
27	Township of POMPEY, Lot No. 63, Onondaga county; 1821.
28	Township of FABIUS, Lot No. 12, Onondaga county; 1821.
29	Township of FABIUS, Lot No. 20, Onondaga county.
30	Map of HOUTTON'S BUSH, Washington county, town of Westfield; surveyed 1798, run into lots in 1801 by James Cockburn.
31	Map of levels along SENECA river, June, 1812.
32	Map of THORN'S SURVEY Tract, Essex county, town of Chesterfield; surveyed 1805, by Stephen Thorn.
33	Map of MORRIS Patent, Otsego county, town of Butternuts, between Susquehanna and Unadilla rivers.
34	Totten & Crossfield's Purchase, Township No. 51, being a triangle north of No. 38, in Herkimer and Hamilton counties; by John Richards, 1821.
35	Totten & Crossfield's Purchase, Township No. 37, Hamilton county; by John Richards, 1821.
36	Totten & Crossfield's Purchase, Township No. 39, Hamilton county; by John Richards, 1821.
37	Map of MOOSE RIVER Tract, Hamilton and Herkimer counties; surveyed by John Richards, Deputy Surveyor, 1820.
38	Map of MOOSE RIVER Tract, Townships 1, 2, and 3, Hamilton and Herkimer counties; surveyed by Samuel B. Anderson, 1821.
39	Map of MOOSE RIVER Tract, Township No. 1, Herkimer county; surveyed 1821, by Samuel B. Anderson.
40	Map of MOOSE RIVER Tract, Township No. 2, Herkimer county; surveyed 1821, by Samuel B. Anderson.
41	Map of MOOSE RIVER Tract, Township No. 3, Hamilton and Herkimer counties; surveyed 1821, by Samuel B. Anderson.
42	Map of MOOSE RIVER Tract, Township No. 9, Hamilton county; surveyed 1820, by John Richards.

No. MISCELLANEOUS MAPS — Continued

43 OLD MILITARY Tract, part of Township No. 12, Essex county; surveyed 1805, by Stephen Thorn.

44 Map of FIRST PAGAN Purchase from Oneida Indians, Oneida county, town of Verona; 1809, by James Geddes.

45 GORE in the division of PITTSTOWN, Rensselaer county; surveyed in 1807 by John Kiersted.

46 Map of unappropriated lands, being Township No. 1 of the Old Military Tract and adjoining lands in Essex county; surveyed in 1805 by Stephen Thorn.

47 Map of SOUTH BAY Tract, Washington county, town of Dresden; laid into 162 lots in 1808 by G. Webster and S. D. Kellogg; also
Map of FIVE MARSH lots in South Bay Tract; surveyed August, 1816, by S. D. Kellogg.

48 Map of STATE LAND, Essex county, town of Ticonderoga; surveyed 1808, by John Kiersted.

49 Map of SCHROON Tract, Essex county, town of Schroon; also BRANT LAKE Tract, Washington county, town of Bolton; surveyed 1803, by George Webster, Deputy Surveyor.

50 Map of WESTFIELD Tract, Washington county, town of Fort Ann; surveyed 1803, by Stephen Thorn.

51 CLINTON township, easternmost range of lots, Chenango county; also confluence of Unadilla and Susquehanna rivers; surveyed Nov., 1787, by John Cox.

52 Map of COXEBOROUGH, or COXE'S Patent, Oneida county.

53 Map of ONTARIO and STEUBEN counties; includes what is now Yates and part of Livingston, Monroe, Schuyler and Wayne counties. (Prior to 1829.)

54 Map of the ORISKANY, or Oriskary Patent, Oneida county; by G. Lansing, surveyor, June, 1785.

55 Part of GLEN'S Purchase and part of ROYAL Grant, First Allotment, towns of Herkimer and Fairfield, Herkimer county; by Lawrence Vrooman, 1815.

56 Lands under water of Hudson river opposite Albany, N. Y., estate of John J. Van Rensselaer; 1807, by J. E. Van Alen.

57 Map of LAKE GEORGE Tract, Washington county, towns of Dresden and Fort Ann; surveyed by S. D. Kellogg, 1811–12.

58 PERU BAY Tract, Essex county, towns of Willsboro, Lewis and Chesterfield; surveyed into 130 lots in 1811 by George Webster, Deputy Surveyor.

59 IRON ORE Tract, Essex county, towns of Moriah, Westport and Elizabethtown; surveyed 1810–11, by S. D. Kellogg.

60 Map of the GORE in Clinton county, town of Plattsburg, adjoining Duer's Patent; laid into 10 lots, by G. Webster, 1819; also
Map of GORE adjoining Scaroon lake, Warren county; surveyed October, 1819, by George Webster.

61 Map of SPLIT ROCK Tract, Essex county, town of Westport; also four pieces of Platt Rogers, Robert Lewis and James Judd; surveyed in 1811 by George Webster.

No. MISCELLANEOUS MAPS — Continued

62 Map of MAGIN'S and LOTT & LOW'S Patents, in Fulton, formerly Montgomery county, town of Palentine.

63 Map of TREMBLEAU Tract, Essex county, town of Chesterfield; 17 lots surveyed 1811, by George Webster.

64 Map of LUZERNE Tract, Washington now Warren county, towns of Luzerne and Caldwell; surveyed 1810, by George Webster.

65 Map of FORT ANN Tract, Washington county, town of Fort Ann; 27 lots surveyed by S. D. Kellogg, 1811–12.

66 Map of NORTH WEST BAY Tract, Warren county, 133 lots; surveyed in 1810 by G. Webster and S. D. Kellogg; also
NORTH WEST BAY Tract, alteration and addition; by George Webster, January, 1812.

67 OLD MILITARY Tract, Township No. 1, West part, Essex county; surveyed 1812–13, by John Richards.

68 FRENCH MOUNTAIN Tract, Washington now Warren county, town of Queensbury; also Nine Islands in Lake George; surveyed May, 1811, by George Webster.

69 OLD MILITARY Tract, Township No. 12, Essex county, part of south half; surveyed in 1812 by John Richards.

70 South part of Oneida Reservation, called NEW PETERSBURG, Madison and Oneida counties; by Joseph Annin, 1793–4.

71 Township appropriated for Roads, Madison county, town of Cazenovia; surveyed by H. P. Schuyler, October, 1789.

72 Map of KINGSBOROUGH, or grants to James Stewart and A. Stevens, Fulton formerly Montgomery county, town of Johnstown.

73 Map of DUERVILLE, Clinton county, 37,800 acres; surveyed by George Fleming, 1788.

74 Map of PLENY MOORE Grant and land adjacent, Essex county, town of Crown Point; 1787.

75 Map of ADGATE'S Patent, Oneida county, town of Boonville; also
WOODHULL Tract, town of Forestport; copied from a map of James Abeel.

76 Map of FUNDA'S Patent, Oneida county, towns of Rome and Floyd.

77 Township of Sidney No. 6, Broome county, and Hamden No. 7, Tioga county.

78 Map of REMSENBURG Patent in Herkimer and Oneida counties, on Black river and Canada creek; 1786.

79 Map of FORT ANN Tract and LAKE GEORGE Tract, Warren and Washington counties; surveyed by Archibald Campbell, 1787.

80 Map of ELLICE'S Patent on Lake George, Warren and Essex counties; surveyed 1794 by R. Cochran.

81 Map of HENRY GLEN'S Patent, called JERSEYFIELD, Herkimer and Fulton counties; 94,000 acres and allowance; 1770.

82 Map of Township No. 5, Chenango, and Township No. 8, Randolph, and part of Township No. 1, Warren.

83 Map of 4,549 acres of land in Schoharie formerly Albany county, east side of Schoharie river near Brakebeen.

84 Map of the town of MASSENA, St. Lawrence county; surveyed June 1788, by R. Cochran.

No.

Miscellaneous Maps — Continued

85 Map of the town of Mayfield, Fulton county; copied from Commissioners of Forfeitures map.

86 Map of 64,669 acres of land in Tioga and Herkimer counties, (John Lincklaen) now in Madison and Chenango counties; surveyed August, 1792, by Nathaniel Locke.

87 Old Military Tract, Township No. 3, Clinton county; granted to Benjamin Birdsall.

88 Map of Bergen's Purchase, Hamilton county; surveyed by Archibald Campbell, December, 1785.

89 Map of Six Mile Square in St. Regis Reservation, Franklin county; surveyed 1799, by Simeon DeWitt.

90 Lands of John Daniel Gros, Thomas Machin and others, in Montgomery and Schoharie counties; by L. Vrooman, July, 1787.

91 Lands of Melancton Smith, John Francis Perache and John McKesson, towns of Rome and Westmoreland, Oneida county; 1792, by Lawrence Vrooman.

92 Map of Sander's Patent, Saratoga formerly Albany county, adjoining Glen's Patent; March, 1789, by L. Vrooman.

93 Map of Nobleborough, Herkimer county; also Arthurborough, Hamilton county; by S. DeWitt, August, 1787.

94 Sundry lands on Delaware river, Broome county, town of Sanford.

95 Lands bought of Oneida Indians, town of Lenox, Madison Co.; 1802.

96 Map of Alexandria, Essex county, town of Ticonderoga, now owned by Alex. Ellice; 1798, by Wm. Cockburn.

97 Map of the Corporation Lands in town of Schaghticoke, Rensselaer county. (Corporation of Albany Lands.)

98 Map of Nathan Mallory Tract, Essex formerly Clinton county; 9,973 acres; by C. C. Brodhead, 1798.

99 Map of landing and cove at Peekskill, Westchester county, for grant of land under water; 1787, by John Dyckman.

100 Map of Palmer's Purchase, by L. Vrooman, Dec., 1787, now in Hamilton, Warren and Saratoga counties.

MILITARY GRATUITY LANDS IN CENTRAL NEW YORK.

101 Township No. 1, Lysander, Oswego and Onondaga counties.
102 Township No. 2. Hannibal, Oswego county.
103 Township No. 3, Cato, Cayuga county
104 Township No. 4, Brutus, Cayuga county.
105 Township No. 5, Camillus, Onondaga county.
106 Township No. 6, Cicero, Onondaga county.
107 Township No. 7, Manlius, Onondaga county.
108 Township No. 8, Aurelius, Cayuga county.
109 Township No. 9, Marcellus, Onondaga county.

By J. Annin and Jacob Hart, 1791.

110 Township No. 10, Pompey, Onondaga county.
111 Township No. 11, Romulus, Seneca county.
112 Township No. 12, Scipio, Cayuga county.
113 Township No. 13, Sempronius, Cayuga and Onondaga counties.

By Moses DeWitt, 1791.

No. MILITARY GRATUITY LANDS IN CENTRAL NEW YORK — Continued

114 Township No. 14, TULLEY, Cortland and Onondaga counties.

115 Township No. 15, FABIUS, Cortland and Onondaga counties.

116 Township No. 16, OVID, Seneca county.

117 Township No. 17, MILTON, Tompkins and Cayuga counties.
By Jacob Hart, 1790.

118 Township No. 18, LOCKE, Tompkins and Cayuga counties.
By Ab'm Hardenburgh.

119 Township No. 19, HOMER, Cortland county.

120 Township No. 20, SOLON, Cortland county.
By Moses DeWitt, 1791.

121 Township No. 21, HECTOR, Tompkins county.
By Thomas Nicholson, Jr.

122 Township No. 22, ULYSSES, Tompkins county.
By Moses DeWitt, October, 1790.

123 Township No. 23, DRYDEN, Tompkins county.

124 Township No. 24, VIRGIL, Cortland county.
By Moses DeWitt, July, 1791.

125 Township No. 25, CINCINNATUS, Cortland county.
By Moses DeWitt, August, 1791.

126 Township No. 26, JUNIUS, Seneca county.

127 Township No. 27, GALEN, Wayne county.
By Joseph Annin, 1798.

128 Township No. 28, STIRLING, Cayuga and Wayne counties.
By Joseph Annin, 1798.

MISCELLANEOUS MAPS.

129 Map of the WILLIAMSON Tract, Wayne county.

130 Map of the land claimed by the STATE in NEW YORK city, corner 16th street and 9th avenue, 16th ward.

131 Plan of village of ONEIDA CASTLE, Oneida county, town of Vernon; by John Randel, Jr., Nov., 1813.

132 Map of NIAGARA River, Erie and Niagara counties, American side.

133 OLD MILITARY Tract, Township No. 11, Essex county; surveyed by Stephen Thorn, 1804.

134 Township of PLATTSBURGH and adjoining lands; also BEEKMAN Township, Clinton county, on Lake Champlain.

135 Grant of land to Alex. MCKEE and others, Otsego county; granted 1770; surveyed by Christopher Yates.

136 Map of BROTHER TOWN, Oneida county; by Gerrit Cluett, 1795.

137 Part of ONEIDA Reservation, Madison and Oneida counties; surveyed by H. P. Schuyler, June, 1798.

138 Map of BENSON Township, Hamilton formerly Herkimer county; surveyed by Lawrence Vrooman, 1795.

139 Map of BAYARD'S Patent, Herkimer and Oneida counties; granted June, 1771; surveyed by Thomas and Beriah Palmer.

140 Map of the HARDENBURGH Patent, Ulster, Delaware and Sullivan counties.

No. MISCELLANEOUS MAPS — Continued

141 Totten & Crossfield's Purchase, Township No. 50, Hamilton and Essex counties; also Township No. 27, north part, Essex county; by John Richards.

142 Map of part of Royal Grant called SCHNELL'S Patent, Herkimer county.

143 Map of STEUBEN Township, Oneida county; 1786.

144 Map of the late CAYUGA Reservation, Seneca and Cayuga counties; surveyed 1795, by Joseph Annin and John J. Cantine.

145 Map of the MORRIS Purchase, or the Holland Land Co.'s land; also land of JOHN WILLINK and others, Western New York; engraved, 1800, by J. & B. ELLICOTT.

146 A scheme for dividing ARTILLERY Patent, Washington Co.; by W. Cockburn, 1765.

147 Western boundary line of Grant to JOHN MORINE SCOTT, Schoharie county; by James Cockburn, 1806.

148 Map of BRISTOL Tract, Schoharie county; run into lots by James Cockburn, Jacob Trumpbour, Jr., 1805.

149 Map of the JAY Tract and WHITEFACE MOUNTAIN Tract, being part of Townships 2 and 11, Old Military Tract, Essex county; by John Richards, March, 1815.

150 Map of ONONDAGA RESIDENCE Reservation, east part, Onondaga county; also map of COWASSELON Tract, Madison county; both by John Randel, Jr., May and June, 1817.

151 OLD MILITARY Tract, Townships Nos. 1, 2, 11, and 12, Essex county; also MALLORY, JAY, WHITEFACE and other tracts; March, 1813.

152 City of TROY, Rensselaer county; by J. Klein, July, 1817.

153 STATE ROAD, west of Lake George, Warren county; surveyed by James Woodworth, 1811.

154 Map of NEW YORK PROVINCE east of Lakes George and Champlain, now Vermont; per Simon Metcalf, 1772.

155 Map of SCHUYLER Patent, Herkimer and Otsego counties; formerly Albany county, per Thomas Palmer; granted June, 1755.

156 Map of the Village in the MILE SQUARE, in the St. Regis Reservation, Franklin county; 1820, by Brodhead and DeWitt.

157 Map of ONEIDA CREEK Tract, Madison county, town of Lenox; surveyed by John Randel, Jr., 1811.

158 OLD MILITARY Tract, Township No. 10, Franklin county; surveyed 1813, by John Richards.

159 Map of OXBOW Tract, Hamilton county formerly Montgomery county; surveyed July, 1811, by L. Vrooman and L. Woodworth.

160 Survey of MEADOWS, Grasse river, St. Lawrence county; June, 1801, by Amos Lay.

161 CANASTOTA Tract, Madison county, town of Sullivan; by C. C. Brodhead and John Randel, Jr., September and October, 1807.

162 Forty GOSPEL and SCHOOL Lots in Oneida Reservation, Madison county; by John Randel, Jr., 1811.

163 Map of ESSEX Tract, Essex county, towns of Jay and Lewis; surveyed 1807, by Enoch F. Henry.

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164 Map of North River Head Tract and Paradox Tract, Essex county, towns of Crown Point, Elizabeth and Schroon; surveyed 1807, by George Webster and S. D. Kellogg.

165 Map of Unappropriated Land in Greene county; surveyed 1806, by James Cockburn.

166 Map of Jersey Gore Tract, Orange and Rockland counties; surveyed by Seth Marvin.

167 Map of part of Randolph Township and 19 lots in town of Windsor, Broome county, by Wm. Macclure, 1820.

168 Boundary line between Massachusetts and New York; Thomas Hutchins.

169 Map of Jacob Lansing's Patent, Herkimer and Montgomery counties; surveyed October, 1754, by John R. Bleecker.

170 Map of Petrie's Purchase, Otsego and Herkimer counties; 1739.

171 Map of Henry Oothout's Grant, Oneida county, formerly Montgomery county; 16,052 acres; December, 1786.

172 Patents of William, George and Enoch Markham, Duncan Campbell, Thomas Hobson and William Bishop, Tryon county, now Hamilton Co.; April, 1774; part of Township No. 20 of Totten and Crossfield's Purchase.

173 Map of part of Randolph Township, Broome county; surveyed January, 1812, by William Macclure.

174 Map of Glenn's Purchase, Herkimer county.

175 Map of the town of Kinderhook, Columbia county; 1798.

176 Map of the village of Salina, Onondaga county.

177 Plan of the town of Chatham, Columbia county.

178 Map of the town of Gallatin, Columbia county; surveyed 1812, by John Wigram.

179 Map of the town of Rhinebeck, Dutchess county; surveyed January, 1798, by Alex. Thompson.

180 Map of Hoffman Township, Essex and Warren counties; from draught of S. Dewey, 1797.

181 Map of Burnet's Field, Herkimer county.

182 Map of Cosby's Manor, Herkimer and Oneida counties, formerly Montgomery Co.; by John R. Bleecker, Aug., 1788.

183 Plan of the Township of Louisville, St. Lawrence county, now Norfolk and Louisville.

184 Map of John Livingston's Patent, Clinton county; also Thomas Maul's Patent, Essex county; surveyed July, 1800, by Simeon DeWitt.

185 Map of grant to Borst & Grestaer, Schoharie county; surveyed April, 1753, by Isaac Vrooman.

186 Map of Staten Island, made in the year 1797.

187 Map of the town of Poughkeepsie, Dutchess county; January, 1798, by Henry Livingston, Jr.

188 Maps of the towns of Germantown and Clermont, Columbia county, January, 1798, by John Wigram.

189 Maps of the towns of Amenia, Clinton, Stanford and Washington, Dutchess county; Dec., 1797, by Jacob Smith.

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MISCELLANEOUS MAPS — Continued

190 Map of Fort Edward and vicinity, Washington county.

191 Map of town of BEEKMAN, Dutchess county; February, 1798, by Henry Livingston, Jr.

192 Map of ALBANY county.

193 Map of STALEY'S Patent, Herkimer county.

194 Map of town of DUANESBURGH, Schenectady county.

195 Map of Katskill Patent and adjoining lands, Greene county; 1764.

196 Village of Fort Covington in Mile Square, of St. Regis Reservation, Franklin county; 1819, by R. V. DeWitt.

197 Map of northern part of New York State; engraved by Amos Lay and Arthur J. Stansbury, 1801.

198 Lands of Jeremiah Van Rensselaer, St. Lawrence county, town of Massena.

199 Map of Chenango Township, or 3rd Hammond Tract, Broome county; surveyed 1788, by James Cockburn.

200 City of SCHENECTADY; January, 1802, by Lawrence Vrooman.

201 ONEIDA RESERVATION; (northwest part of) Madison county; surveyed 1803, by Charles C. Brodhead.

202 Part of ONEIDA RESERVATION, Madison county; surveyed 1803, by C. C. Brodhead.

203 Northwest part of ONEIDA RESERVATION, Madison county; surveyed 1804, by C. C. Brodhead and John Randel, Jr.

204 Map of SCRIBA'S Patent; BLACK RIVER Tract; BOYLSTON Tract; in Oneida county; 1793 to 1798, by Benjamin Wright.

205 Totten & Crossfield's Purchase; 1772, by Ebenezer Jessup.

206 Lands purchased from Indians, Oneida and Madison counties; compilation of all purchases.

207 Map of boundary line between New York and Pennsylvania, by Abraham Hardenburgh.

208 Map of the HAGUE Tract, Essex and Warren counties; 62 lots; surveyed 1816, by S. D. Kellogg.

209 Map of CANADIAN and NOVA SCOTIA REFUGEE LANDS, Clinton county.

210 Map of ONONDAGA Reservation, Onondaga county; surveyed 1795, by Joseph Annin and John J. Cantine.

211 Map of ROOSEVELT & COMPANY Tract, Oneida and Oswego counties; 538,966 acres; surveyed 1792, by James Cockburn.

212 Map of Township of CHEMUNG, Chemung and Tioga counties; 1788, laid out by James Clinton, John Hathorn and John Cantine.

213 Map of the different lines run for the Third Tract VAN BERGEN'S Purchase, Greene county; per James Cockburn, 1809.

214 Map of the two Northern Ranges of Townships, St. Lawrence county.

215 MACOMB'S Purchase, Great Lot No. 4, Jefferson county; surveyed 1796, by Charles C. Brodhead.

216 UNAPPROPRIATED land, Greene county, towns of Windham, Catskill, Canton and Freehold; 1805, by Jacob Trumpbour.

217 Map of MACOMB'S Purchase, Jefferson and Lewis counties; by Charles C. Brodhead.

218 Map of CHENANGO TRIANGLE, Chenango and Broome counties; surveyed July, 1792, by Nathaniel Locke.

No. MISCELLANEOUS MAPS — Continued

219 Map of part of GREAT NINE PARTNERS grant, Dutchess county; 1697.

220 Map of Chenango Twenty Townships, Chenango and Madison counties; Feb., 1789.

221 Map of ESSEX county and part of HAMILTON county; also Totten and Crossfield's Purchase.

222 Map of the ROYAL Grant, Herkimer county; surveyed 1797, by Lawrence Vrooman.

223 Map of STIRLING, or Township No. 28, Military Gratuity Lands.

224 Map of old Fort George in New York city; 1788.

225 Lands between Mohawk and Delaware rivers, showing various grants.

226 Map of Tract of land "West of Road Patent", Essex county; surveyed in 1808, by George Webster.

227 ONEIDA RESERVATION, Oneida and Madison counties; surveyed in 1796, by H. P. Schuyler.

228 MACOMB'S Purchase, Great Lot No. 4, Jefferson and Lewis counties; surveyed 1798, by C. C. Brodhead.

229 Map of the towns of Clinton, Fayette, Greene and Warren; in Broome and Chenango counties.

230 Map of the village of Oswego, Oswego county; surveyed 1814, by John Randel.

231 Map of the town of FISHKILL, Dutchess county; surveyed February, 1798, by Henry Livingston, Jr.

232 Lands in Warren and Washington counties, on Lake George.

233 Map of LIVINGSTON Manor, Columbia county; surveyed January, 1798, by John Wigram.

234 Towns of CLAVERACK and GREENPORT and city of HUDSON, Columbia county; Jan., 1790, per Jonas Smith.

235 Totten & Crossfield's Purchase, Township No. 28, Essex county; and Township No. 27, TIVIOTDALE.

236 Totten & Crossfield's Purchase, Township No. 46, Essex county, and Township No. 3, Hamilton Co.; surveyed 1772, by A. Campbell and A. Hanborough.

237 Map of lands in ORANGE and ULSTER counties.

238 Proposed Plan of a Village at Black Rock, Erie county; 1804.

239 Totten & Crossfield's Purchase, Township No. 24, Warren county.

240 Map of Edward Thatcher's land in Essex county, 10,000 acres; surveyed 1774, by Wm. Cockburn; also,
Map of POINT AU FER, Clinton Co.; 1805, by Wm. Beauman.

241 Map of JUNIUS, Lots Nos. 10 and 20, Seneca county; also
HECTOR, Lot No. 91, Tompkins county; also
LOCKE, Lots Nos. 2 and 26, Cayuga county; also
OVID, Lot No. 91, Seneca county.

242 Map of DRYDEN, Lot No. 10, Tompkins county; also
HECTOR, Lot No. 72, Tompkins county; also
JUNIUS, Lot No. 6, Seneca county; also
MILTON, Lots Nos. 65 and 83, Tompkins county.

243 Map of CATO, Lot No. 98, Cayuga county; also
JUNIUS, Lot No. 89, Seneca county; also
SOLON, Lots Nos. 9 and 73, Cortland county.

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244 Map of HECTOR, Lot No. 87, Tompkins county; also
MANLIUS, Lot No. 30, Onondaga county; also
MARCELLUS, Lot No. 86, Onondaga county; also
MILTON, Lot No. 90, Tompkins county; also
ULYSSES, Lot No. 27, Tompkins county.

245 Map of DRYDEN, Lot No. 68, Tompkins county; also
HECTOR, Lot No. 85, Tompkins county; also
MARCELLUS, Lot No. 88, Onondaga county; also
SEMPRONIUS, Lots Nos. 57 and 59, Cayuga county; also
ULYSSES, Lot No. 37, Tompkins county.

246 Map of BRUTUS, Lot No. 81, Cayuga county; also
CINCINNATUS, Lots Nos. 30 and 45, Cortland county; also
HECTOR, Lot No. 54, Tompkins county; also
LYSANDER, Lot No. 46, Onondaga county; also
MILTON, Lot No. 8, Cayuga county; also
OVID, Lots Nos. 66 and 79, Seneca county.

247 Map of AURELIUS, Lot No. 32, Cayuga county, town of Sennett; also
CAMILLUS, Lot 97, Onondaga county, town of Camillus; also
JUNIUS, Lots Nos. 53 and 68, Seneca county; also
SCIPIO, Lot No. 79, Cayuga county, town of Ledyard.

248 Map of GRAND ISLAND, Niagara river, Erie county.

249 Map of St. Lawrence river, Ogdensburg to Louisville; copied from original maps by W. A. Bird.

250 Map of St. Lawrence river, Louisville to St. Regis river; copied from original maps by W. A. Bird.

251 Map of GORE between Dartmouth Patent and Totten & Crossfield's Purchase, Warren Co.; 1822, by John Richards, Deputy Surveyor; also
NORTH GORE between Townships 12 and 14, Totten & Crossfield's Purchase; also
GORE between Townships 29 and 31, Totten & Crossfield's Purchase; surveyed 1822, by John Richards, Deputy Surveyor.

252 Map of HYDE Township; DARTMOUTH Patent and adjacent lands in Warren county.

253 Part of Canadian Refuge Tract and Gore adjoining, Clinton Co.

254 Map of GORE in Essex county, town of Essex; surveyed in 1822, by S. D. Kellogg, Deputy Surveyor.

255 OLD MILITARY TRACT, Township No. 9, Franklin county; surveyed 1822, by S. D. Kellogg, Deputy Surveyor.

256 Map of FABIUS, Lot No. 8, Onondaga county; also
FABIUS, Lot No. 86, Cortland county; also
LOCKE, Lot No. 42, Cayuga county, surveyed 1825, by Richard Townley; also
LOCKE, Lot No. 44, Cayuga county, town of Locke.

257 Map of FABIUS, Lot No. 95, Cortland county; also
SOLON, Lot No. 90, Cortland county; also
STIRLING, Lot No. 36, Cayuga county; also
VIRGIL, Lot No. 58, Cortland county.

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258 Map of Aurelius, Lot No. 24, Cayuga Co.; by John McFadden; also
Hector, Lot No. 80, Tompkins county; by John McFadden; also
Milton, Lot No. 85, Tompkins county; by John McFadden.

259 Map of Cato, Lot No. 64, Cayuga county; by John McFadden; also
Hector, Lot No. 20, Tompkins county; by John McFadden; also
Lysander, Lot No. 67, Onondaga county; by John McFadden; also
Milton, Lot No. 80, Tompkins county; by John McFadden.

260 Map of Cincinnatus, Lots 29 and 46, Cortland county; also
Fabius, Lots Nos. 65 and 84, Cortland county.

261 Old Military Tract, Township No. 9, east part, Franklin county; surveyed Oct., 1823, by S. D. Kellogg.

262 Lands bought of Stockbridge Indians, Oneida and Madison counties; November, 1823, by Peleg Gifford.

263 Map of New Stockbridge and lands adjacent, Oneida and Madison counties; Dec., 1823, by Peleg Gifford.

264 Map of Crumhorn Mountain Tract, Otsego county; November, 1822, by David L. Sayre, surveyor.

265 Map of 201 acres of land adjoining Varick & Bell's Patent, Madison county, town of Sullivan; 1823, by John Adams; also
Ovid, Lot No. 75, Seneca county, town of Lodi; also
Ulysses, Lot No. 41, Tompkins county, town of Ithaca.

266 Map of Carlton, or Buck's Island in St. Lawrence river, Jefferson county; 1823, by F. R. Hassler.

267 Map of Gull and Snake Islands in Lake Ontario, Jefferson county; Sept., 1817, by C. C. Brodhead for D. A. Ogden.

268 Map of Galloe, Calf and Stony Islands in Lake Ontario, Jefferson county; Sept., 1817, by C. C. Brodhead for D. A. Ogden.

269 Map of Grand Island, Niagara river, Erie county; surveyed Oct., 1824.

270 Map of Grenadier and Fox Islands in Lake Ontario, Jefferson county; Sept., 1817, by C. C. Brodhead for D. A. Ogden.

271 Map of Cherry Island in Chaumont bay, Lake Ontario; Sept., 1817, by C. C. Brodhead for D. A. Ogden.

272 Map of the towns of Lloyd and New Paltz, Ulster county.

273 Map of State Road, Hamilton county; surveyed October, 1825, by Eliphalet St. John.

274 Map of Gore in Essex county, town of Essex; surveyed 1822, by S. D. Kellogg.

275 Map of Boston Ten Townships, Tioga and Broome counties; surveyed 1805, by James Geddes.

276 Map of Cession by Holland Land Co. to the Erie Canal, Cattaraugus county.

277 Map of Mile Square in Massena, St. Lawrence county; 1824, by Samuel B. Anderson; also
Map of five lots south of and adjoining Maul's Patent, in Essex county; by Thomas Stoneer; also
Map of South Tract in town of Lewis, Essex county, adjoining Roger's Tract, south of Essex Tract; also
Map of Mill Lot, and adjacent lands at Oneida Castleton, Oneida county; Jan., 1828, by Peleg Gifford; also

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Land from Oneida Indians, town of Lenox, Madison county; May, 1826, by Peleg Gifford; also

Part of New Stockbridge on Oneida creek; also

Map of New Guinea Tract, Madison county, south part of New Stockbridge; also

Map of part of Black Rock village, Erie county; December, 1827.

278 Map of St. Regis Reservation, 1,000 acres, Franklin county; February, 1825, by Samuel B. Anderson; also

Map of 1,877 acres from St. Regis Indians; March, 1826, by Samuel B. Anderson; also

Map of Isle au Long Saulte, St. Lawrence river, St. Lawrence Co.; 1826, by Samuel B. Anderson; also

Lands from Oneida Indians, Madison county, town of Lenox, and Oneida county, town of Vernon; February, 1825, by Gifford.

279 Map of Cowasselon Tract, Lot No. 8, Madison county; surveyed July, 1829, by John Randel, Jr.

280 Plan of Black Rock Harbor and part of Niagara river, Erie county; 1825.

281 Map of Black Rock Harbor Lots, Erie county; 1826, by Simeon DeWitt.

282 Map of Granger & Hornby Tract, and Phelps & Gorham's Tract, Townships 3 and 4 in 2nd. Range, Steuben county; also

Lands of J. Van Rensselaer and others, Fulton county; surveyed August, 1802, by J. E. Van Alen.

283 Map of Boundary line between Dutchess and Putnam counties; 1833, by Jacob Trumpbour.

284 Map of part of Sacondaga Patent, Fulton and Saratoga counties; June, 1802, by John Preston; also

Black Rock Harbor Lots; Erie county.

285 Map of State Lots, Albany, N. Y., Lawrence and DeWitt streets; August, 1831, by P. Hooker. City Surveyor.

286 Map of Sacondaga Patent, Fulton and Montgomery counties.

287 Map of Sacondaga Patent, Outbounds, Fulton and Montgomery counties; Oct., 1801, by John E. Van Alen.

288 Land of Jeremiah Van Rensselaer and others, Fulton Co.; surveyed June, 1788, by John Campbell, Surveyor; also

Map of part of Oswego village, Oswego county.

289 Map of the village of Buffalo, Erie county.

290 Map of Schuyler Patent, part of town of Fort Edward, Washington Co.; also

Map of 1,000 acres from Oneida Indians, Orchard Party, Oneida county; May, 1830, by Peleg Gifford; also

Land from Oneida Indians, First Christian Party, Madison county; December, 1829, by Peleg Gifford; also

Map of Winne's Patent, on Mohawk river, Montgomery county.

291 Map of the Narrows between Staten Island and Long Island.

292 Map of Alex. McKee Patent, and Israel Spencer and others; also State land adjoining; in county of Otsego; surveyed 1828, by Jacob Trumpbour.

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293 Totten & Crossfield's Purchase, land north of 45th Township, Essex county; surveyed August, 1833, by John Richards.

294 Map of the village of LODI. Onondaga county; by John Randel, Jr.

295 Black Rock Harbor, Plan for Public Lands, Erie county; February, 1826, by Nathan S. Roberts, Surveyor; also
Map of CANAL LANDS, Cataraugus county.

296 Part of WOOD CREEK Reservation, Oneida county; July, 1832, by Peleg Gifford, Deputy Surveyor.

297 Map of SADAQUEDA Patent, Lot No. 2, Oneida Co.; by C. C. Brodhead; also
SACONDAGA Patent, Lot No. 13, Fulton county; January, 1814, by A. St. John.

298 OLD MILITARY Tract, Township No. 11, Essex county; surveyed 1832, by John Richards.

299 Map of KIPP'S BAY FARM, Lot No. 38, 12th Ward, New York city; September, 1826, by Daniel Ewen. City Surveyor; also
Map of part of the village of Oneida Castleton, Oneida county; July, 1833, by Samuel Breese, Surveyor.

300 Map of GORE east of Old Military Tract in Clinton county; surveyed in 1829 by John Richards.

301 Map of 1,000-acre Tract, Monroe county, formerly Ontario county, town of Brighton; Dec., 1829, by J. McFadden; also
St. Regis Indian Reservation, east part, Franklin county, Jan., 1832, by Henry Longley.

302 Map of LAKE GEORGE; by Robert Cochran, 1793.

303 Map of Basin Lots, village of Geddes, town of Salina, Onondaga county; Oct., 1829, by Calvin Guiteau, Surveyor; also
Map of Marsh Lot No. 42, Geddes; by Ashbel Kellogg; also
Part of Geddesburgh; 1822, by John Randel, Jr.; also
Part of village of Geddes; by Kellogg, 1831; also
Map of the village of Liverpool, Onondaga county.

304 Map of KIPP'S BAY, Farm lots Nos. 2, 16 and 18, 12th ward, New York city; by Daniel Ewen, City Surveyor.

305 Map of village of Salina, Salt Manufacturing Lots, Onondaga county; February, 1830, by Ashbel Kellogg.

306 Map of Land near Lots Nos 20 and 21, Niagara Tract, Niagara county; Nov., 1833, by Joseph Clary; also
Map of STEDMAN Farm, Niagara county; October, 1828, by Joseph Clary, Surveyor.

307 Map of INDIAN MEADOWS on Grasse river, St. Lawrence Co., town of Massena; June, 1845, by John W. Tate.

308 Map of KIPP'S BAY Farm, Lot No. 23, 12th Ward, New York city; Sept., 1826 by Daniel Ewen; also
Map of village of Geddes, Onondaga county; October, 1829, by Calvin Guiteau.

309 Map of the village of Geddes, Onondaga county, town of Salina; August, 1828, copied from map of J. Randel, Jr.

310 Land for MARINE RAILWAY, at village of Oswego, N. Y.; 1832.

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311 Village of Syracuse, Salt manufacturing lots; February, 1830, by Ashbel Kellogg; also
Map of town of Pharsalia, Chenango Co., with subdivisions; Aug., 1826, by Peleg Gifford; also
Map of BUTTON RANGE, Chenango Co, town of Preston.

312 Map of part of Onondaga Salt Springs Reservation, Onondaga county; July, 1827, by Ashbel Kellogg.

313 Part of village of LEWISTON, Niagara county; Dec., 1828, by J. Clary.

314 Map of the village of BLACK ROCK, Erie county; May, 1836, by Henry Lovejoy. (Engraved.)

315 Map of part of village of Black Rock, Erie county; by H. Lovejoy.

316 Map of MOOSE RIVER Tract, Hamilton and Herkimer counties; 1837, by Daniel Gilbert.

317 Part of village of Oneida Castleton, Oneida county; by Samuel Breese.

318 Map of Oswego, Blocks 1 and 2, Old Fortification; Oct., 1835.

319 Map of Oswego Harbor; 1827.

320 Map of part of Syracuse, Blocks 67, 80 and 131, Onondaga county.

321 Map of MOOSE RIVER Tract, Township No. 4, Hamilton county, 1823, by Duncan McMartin, Jr.

322 Map of FOUR BROTHERS Islands in Lake Champlain, Essex county; 1836, by J. N. Macomber.

323 Boundary line between Montgomery and Fulton counties; 1838, by James Frost.

324 Map of OLD MILITARY Tract, Outbounds, Clinton, Franklin and Essex counties; 1787, by George Fleming.

325 Map of town of URBANA, Steuben county; August, 1839.

326 City of Troy, Rensselaer county; 1835, by A. S. Beers. (Engraved.)

327 Map of Syracuse, BLOCK No. 67, Onondaga county.

328 Map of SNYDER'S Patent, Rensselaer county and Vermont; by Alex. Colden.

329 Map of CARY'S and MCNEIL'S Patents, Otsego county, town of Springfield; November, 1838, by Wm. Campbell.

330 FABIUS, Lot No. 74 in part, Cortland county, town of Truxton; July, 1818, by John Randall, Jr.; also
SOLON, Lot No. 16, Cortland county; July, 1818, by same.

331 Map of township of EAST HAMPTON, Suffolk county, L. I.

332 Lands on Onondaga creek at Syracuse, N. Y.

333 Lands on Hudson river, Rensselaer county, town of Schaghticoke; by Wm. Cockburn for Robert Leake and others.

334 MACOMB'S Purchase, Great tract 3, Township 5, part of the township of Russell, St. Lawrence county; by R. Tate and Son.

335 Map of Oswego FORTIFICATION, Block No. 2.

336 MACOMB'S Purchase, Great tract 3, Township 5, Township of Russell, St. Lawrence county, by Timothy Blair.

337 Lands of the Onondaga and Syracuse Salt Co., Onondaga county; 1836, by Hugh Lee, Deputy Surveyor.

338 Part of city of Albany, showing lands of Yates and McIntyre.

339 Map of the Hudson River Improvement at Albany, N. Y.; January, 1839, by Leadbetter and Bradt.

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340 Part of Poughkeepsie, Dutchess county, showing lands of John Delafield; July, 1836, by Henry Whinfield, Engineer.

341 Map of PHELPS & GORHAM'S Purchase in Massachusetts Preëmption, now Ontario county; about 1800.

342 Syracuse, N. Y., various lots and appraisals; 1855.

343 Map of part of Oswego village, east side, Oswego county; September, 1811, by James Geddes.

344 Map of ALEX. WALLACE Patent, Delaware and Otsego counties; 1774, by Wm. Cockburn and John Wigram.

345 PHELPS & GORHAM'S Purchase, Genesee lands, Ontario Co.

346 Map of purchase of 1840 from Indians, Oneida and Madison counties; by N. Burchard, Surveyor.

347 Part of village of LEWISTON, Niagara Co.; by J. P. Haines, 1847.

348 Town of SOUTH HAMPTON, Suffolk county, L. I.

349 Map of Hudson river, Albany to New York; by Robert Yates.

350 Map of STATE ROAD from Port Kent, Clinton Co., to Hopkinton, St. Lawrence Co.; surveyed 1827, by James Frost.

351 Village of LEWISTON, Niagara Co.; 1839, by J. P. Haines.

352 Map of town of BROOKHAVEN, Suffolk county, L. I.; November, 1737, by Isaac Hulse, Surveyor.

353 Map of the HOOSIC Patent, Rensselaer and Washington counties; 1754, by John R. Bleecker, Surveyor.

354 Town of SMITHTOWN and WINNECOMMAC Patent, Suffolk county, L. I.: by John Howard, Surveyor.

355 Map of part of Onondaga Salt Springs Reservation, Onondaga county; 1836–38, by B. F. Green and H. Lee, Deputy Surveyors.

356 Map of Geddes Salt Lands, Onondaga Co.; 1838, by Lee and Weeks.

357 Part of Onondaga Salt Springs Reservation; 1838, by B. F. Green.

358 Part of Onondaga Salt Springs Reservation; 1838, by B. F. Green.

359 Towns of Cortland and Yorktown, Westchester county, also town of Stephentown, now Somers, Westchester Co.; copied from a survey by Philip Verplanck.

360 Map of the town of MONTGOMERY, Orange county; January, 1798, David Galatain, W. H. Smith.

361 Map of PITTS TOWN Tract, Rensselaer county.

362 Map of part of village of LIVERPOOL, Onondaga Co.; Dec., 1807, by James Geddes for W. Kirkpatrick.

363 Map of SCHOHARIE county; 1796.

364 Map of the village of SALINA, Onondaga county; December, 1807, by James Geddes for W. Kirkpatrick.

365 Map of the town of HEMPSTEAD, Queens county, L. I.; September, 1797, by William M. Stewart.

366 Plans for a State Arsenal; 1841.

367 Map of the town of MARLBORO, Ulster county; by Dr. Benjamin Ely, 1797.

368 Map of the town of FLATBUSH, Kings county; surveyed November, 1797, by Jeremiah Lott; also

Map of the town of FLATLANDS, Kings county; surveyed November, 1797, by Jere. Lott.

No. MISCELLANEOUS MAPS — Continued

369 Map of the town of CATSKILL, Greene county; by John J. Cantine, 1798.

370 Map of the town of WILLSBOROUGH, Essex county; by Thomas Stower, Surveyor.

371 Towns of MARBLETOWN and HURLEY, in Ulster county; 1797.

372 Map of the county of RICHMOND, or STATEN ISLAND.

373 Boundary line between the counties of Herkimer and Montgomery; November, 1801, by Evans Wharry.

374 Map of MINISINK Patent, Orange and Sullivan counties; May, 1771, by Alex Colden.

375 Map of the town of THURMAN, Warren county; also
Map of TURNER'S Tract, Washington county, between Lake George and Lake Champlain; Dec., 1812.

376 Town of FREDERICKS, Dutchess Co., now town of KENT, Putnam county; by Robert Weeks, Surveyor; also
Town of CARMEL, Putnam county, formerly Dutchess county; by Robert Weeks, Surveyor.

377 Land of Peter Vosburrough and others, Columbia county, town of Chatham, adjoining Burger Huyck and others.

378 Map of ROAD from Oxbow lake from 8 miles north from Johnstown; June, 1810, by Lawrence Vrooman.

379 Map of the town of ROCHESTER, Ulster county; by A. Vernooy, 1797.

380 Map of the town of EAST CHESTER, Westchester Co.; by Chris. Colles.

381 ONONDAGA SALT SPRINGS RESERVATION, Lot 252 in part, Syracuse; surveyed Dec., 1838, by B. F. Green, Deputy Surveyor.

382 Town of SOUTH EAST, Dutchess Co. now Putnam Co.; also town of FRANKLIN, Dutchess Co., now town of PATTERSON, Putnam Co.; by Samuel Cornwall, Dec., 1797.

383 Map of the town of NEW PALTZ, Ulster county; surveyed January, 1798, by J. Le Fever.

384 Map of proposed CANAL at Fort Stanwix, Oneida Co.; 1791.

385 Map of the town of NEW BURGH, Orange county; surveyed May, 1798, by William W. Sackett.

386 Map of LINE west from Fort George, Warren and Saratoga Co.

387 Map of the town of NEW ROCHELLE, Westchester county; 1711; copy of map surveyed by Abraham Bond.

388 Map of the town of NEW WINDSOR, Ulster county; surveyed by Charles Clinton, December, 1797.

389 Lands in Ulster Co., showing various grants; by Thos. Palmer, 1772.

390 Map of the JERSEY GORE, Orange and Rockland Co.; by Seth Marvin.

391 Map of town of BUSHWICK, Kings county, L. I.; surveyed March, 1839, by Isaac W. Herbert.

392 Map of town of POUNDRIDGE, Westchester county; surveyed November, 1797, by Charles Webb; also
Town of NORTH CASTLE, Westchester Co.; by Wm. Adams.

393 Map of SUFFOLK county, eastern part of Long Island.

394 Map of the town of SOUTHOLD, Suffolk county, L. I.; surveyed in 1797, by Thomas Moore.

No.

MISCELLANEOUS MAPS — Continued

395 Map around Salt Springs near Onondaga lake, Onondaga Co.; by S. DeWitt, 1797.

396 Map of the town of FREEHOLD, Albany, now Greene county; surveyed 1797, by David Baldwin.

397 Map of traverse on Lake Champlain, Essex and Clinton counties; 1787, by George Fleming.

398 Map of town of BROOKLINE (Brooklyn). Kings county, L. I.; October, 1797, by Henry Beadel; Surveyor; also
Town of BUSHWICK, Kings Co.; by H. Beadel; also
Town of NEWTOWN, Queens Co.; November, 1797, by William M. Stewart, Surveyor.

399 Map of the town of KINGSTON, Ulster county, N. Y.; surveyed January, 1798, by Christopher Tappen.

400 Map of ROAD in Westchester county.

401 Map of the town of YONKERS, Westchester Co.; 1797.

402 Map of part of Capt. John Evans Patent, Ulster county; surveyed in 1797, by Jonas Smith.

403 Map of the town of CARLISLE, Schoharie county; copied from a map made by Matchin in 1807.

404 Map of the town of PELHAM, Westchester county, surveyed Feb'y 1798, by James Davenport; also
Town of GREENBURG, Westchester county, by Wm. Adams; also
Town of HARRISON, Westchester county, by William Vail; also
Town of WHITE PLAINS, Westchester county.

405 Map of town of RYE, Westchester county; surveyed in October, 1797, by Charles Webb.

406 Village of Salina with Pasture Lots, Onondaga county; surveyed June, 1798, by William Stevens.

407 Village of GEDDES, Onondaga Co.; by James Geddes, Dec., 1807.

408 Map of part of St. Lawrence river, Canadian side, opposite Louisville and Massena, St. Lawrence county; also
Map of 500 acres on the Beaver kill.

409 Map of sundry lands adjoining Capt. John Evans Patent in Ulster county; also part of MINISINK ANGLE, Orange Co.

410 Map of ONONDAGA, or Salt lake, Onondaga county.

411 Map of the town of KINDERHOOK, Columbia county, N. Y.

412 Map of Traverse of part of Lake Champlain, Essex county; 1787, by George Flemming.

413 Map of LIVINGSTON Patent. Delaware county; Oct., 1785.

414 Map of the town of OYSTER BAY, Queens county, L. I.; surveyed November, 1797, by Wm. M. Stewart.

415 Map of the town of FLUSHING, Queens county, L. I.; surveyed Oct., 1797, by William M. Stewart; also
Town of NORTH HEMPSTEAD, Queens county, L. I.; by William M. Stewart.

416 Map of land called EAST PATENT, Westchester county; about 1762, by Nathaniel Merritt, Surveyor; also
Land of Robert Walters and others, 16 lots, 4,145 acres, Westchester Co.; about 1762, by Nath. Merritt.

No. MISCELLANEOUS MAPS — Continued

417 Map of the town of New Utrecht, Kings county, L. I.; surveyed October, 1797, by Jeremiah Lott.

418 Town of Mount Pleasant, Westchester Co.; by William Adams.

419 Map of the town of Macomb, St. Lawrence county; surveyed in 1842, by C. A. Parker.

420 Town of Coxsackie, Greene Co.; by Leonard Bronk.

421 Plan of the town of Salem, Westchester county; December, 1797, by Benjamin Smith, Surveyor.

422 Map of the town of New Castle, Westchester county; surveyed 1797, by William Adams.

423 Map of township of Islip, Suffolk county, L. I.; surveyed 1798, by Samuel Wheeler.

424 Map of township of West Chester. (Part only.)

425 Map of part of the village of Black Rock, Erie county; surveyed August, 1847, by Henry Lovejoy.

426 Map of the town of Shawangunk, Ulster county; by J. Bruyn, 1798.

427 Map of Fort Richmond, Town of Southfield, Staten Island.

428 Map of lands adjacent to Lake Champlain. Clinton and Essex Co.

429 Town of Gravesend, Queens county, L. I.; by John Terhune.

430 Map of the town of Phillipstown, Putnam county.

431 Map of the town of Jamaica, Queens county, L. I.; surveyed October, 1797, by Wm. M. Stewart.

432 Map of the town of Scarsdale, Westchester county; surveyed 1774, by Charles Webb; also

Town of Mamaroneck, Westchester county; surveyed 1774, by Charles Webb.

433 Map of the town of Shawangunk, Ulster county.

434 Lands from Oneida Indians, Orchard Party, Oneida county; 1841–2, by Nathan Burchard.

435 Map of Onondaga Salt Springs Reservation, Onondaga county; surveyed 1838, by Benjamin F. Green, Deputy Surveyor.

436 Lands from Oneida Indians, Orchard Party, Oneida county; May, 1842, by Nathan Burchard.

437 Map of Oneida Purchase, Christian Parties; surveyed May, 1842, by Nathan Burchard.

438 Map of the towns of Esopus and New Paltz, Ulster county; surveyed April, 1842. by George Van Vliet.

439 New York State Land in Albany, 8th ward; surveyed December. 1843, by Alex. Campbell.

440 Fort Niagara Tract, Niagara Co.; 1844, by J. P. Haines.

441 Town of Dryden, Lot No. 35, Tompkins Co.; by James Geddes, 1814.

442 Town of Truxton, formerly Solon, Lots 16 and 26, Cortland county; surveyed 1815. by James Geddes.

443 Map of James B. Taylor's land, Kings Co., town of Bushwick; surveyed 1851. by H. F. Betts.

444 Vanderheyden Property at Troy, N. Y.; 1835, by A. Danker.

445 Map of the village of Oneida Castleton, Oneida county, town of Vernon; 1852, by Breese, Gifford and Randel.

446 Mill Pond Improvement, Syracuse, N. Y.; 1849, by B. F. Green.

No. MISCELLANEOUS MAPS — Continued

447 Map of 3 acres of D. B. Brandeth's land, Sing Sing; part of Prison farm, Westchester Co.; 1852.

448 ONONDAGA SALT SPRINGS RESERVATION, village of Salina; 1848, by B. F. Green.

449 ONONDAGA SALT SPRINGS RESERVATION, Syracuse and Salina; 1848, by B. F. Green.

450 ONONDAGA SALT SPRINGS RESERVATION, village of Liverpool; 1848, by B. F. Green.

451 ONONDAGA SALT SPRINGS RESERVATION, Syracuse; 1848, by B. F. Green.

452 ONONDAGA SALT SPRINGS RESERVATION, village of Geddes; 1848, by B. F. Green.

453 Map of State Land at Syracuse, N. Y.

454 Map of Onondaga creek, Syracuse; Jan., 1849, by B. F. Green.

455 Map of Salina MARSH LOTS Nos. 12 and 13; by B. F. Green, 1855.

456 Salina FIFTEEN ACRE Marsh Lots; 1854–5, by B. F. Green; also
Town of Geddes, Sub. 1 & 2, LOT 324; by B. F. Green; also
Onondaga Salt Springs Reservation FARM LOTS Nos. 111 and 112; also
Salina MARSH LOTS Nos. 37 and 38; by B. F. Green.

457 Plan of Salt Vats at Syracuse; by J. M. Trowbridge, 1851.

458 State Lands, Syracuse; surveyed April, 1853, by B. F. Green; also map of same by J. M. Trowbridge.

459 Village of Geddes, Block 33, Lots 3A and 3B, Onondaga county; Jan., 1855, by Green; also city of Syracuse, 5th ward; March, 1855, by Green.

460 Theophylact BACHE's two tracts, Essex and Warren counties; surveyed in 1771, by Will Cockburn.

461 Map of ONONDAGA RESIDENCE RESERVATION, Onondaga county, with field notes, surveyed 1856, by B. F. Green.

462 Map of CATSKILL Patent, Greene county.

463 Map of Bushwick creek, or inlet, Kings county, L. I., surveyed 1851, by Hyatt F. Betts.

464 Land of Schermerhorn, Banker & Co., Kings county, town of Bushwick; 1851, by Daniel Ewen.

465 Map of ORISKANY Patent, Oneida county.

466 REFUGEE tract, LOT 252, Clinton county, town of Plattsburgh; surveyed 1848, by Samuel Shaw.

467 Map of Bushwick creek, or inlet, Kings county, and adjoining lands; surveyed 1851, by Hyatt F. Betts.

468 Map of the village of Tonawanda, Erie and Niagara counties; drawn by Tobias Witmer, 1857. (Engraved.)

469 Map of Fort Niagara Tract, Niagara Co.; by J. P. Haines, 1840.

470 Proposed Hudson and Harlem river canal, 1865.

471 Map of TOMPKINS county.

472 Profile of the Wallkill river at Walden, Orange county.

473 Harlem river at Berrian's Landing, Westchester county; 1855, by L. E. Horton.

474 John Bussing's grant of land under water at Berrian's Landing, Harlem river, Westchester county.

MISCELLANEOUS MAPS — Continued

No.

475 Proposed extension, city of ROCHESTER; 1874, by W. S. G. Lynn.

476 LAKE GEORGE from original plot; by S. R. Stoddard.

477 State lands, 3rd ward, Syracuse; 1873, by R. Griffin, Jr.

478 NEW YORK STATE, 1842, showing counties, towns and census.

479 City of ROCHESTER; 1839, by Silas Cornell, City Surveyor.

480 City of TROY; 1845, by S. A. Beers, C. E.

481 NEW YORK STATE, by DeWitt, Sheet No. 1, central part.

482 Village of CANAJOHARIE, Montgomery county; 1857, surveyed and published by T. & J. Slator. (Engraved.)

483 Village of BLACK ROCK, Erie county; 1816, by Lemuel Foster.

484 ADGATE'S WESTERN patent, allotment in Boonville, Oneida Co.; surveyed 1794, by Benj. Wright.

485 HAMILTON and part of HERKIMER counties; 1851, by Wm. D. Jones.

486 Villages of SING SING and SPARTA, Westchester county; 1820, by George W. Cartwright.

487 CAYUGA INDIAN RESERVATION, 1795, Cayuga and Seneca counties; also
ONONDAGA RESERVATION, Onondaga county; also
ONEIDA RESERVATION, Oneida and Madison counties.

488 STATE OF NEW YORK; 1804, by Simeon DeWitt.

489 PALMER'S PURCHASE in Hamilton, Warren and Saratoga counties; surveyed Dec., 1787, by Lawrence Vrooman.

490 NORTHAMPTON PATENT, Fulton and Saratoga counties.

491 Traverse of highways, Albany to Fishkill and Newburrough, both sides of the Hudson river.

492 HAMILTON and part of HERKIMER counties; 1851, by Wm. D. Jones.

493 OLD MILITARY TRACT, Township No. 5; 1822, by C. W. M. Johnson.

494 Coarse Salt lands at Syracuse, N. Y.; by D. E. Whitford.

495 City of BUFFALO; 1876, by G. E. Mann. (Engraved.)

496 STATE LANDS at Syracuse, N. Y., with subdivisions; 1853.

497 Salt Lots, Third ward, Syracuse; Sept., 1881.

498 TOTTEN & CROSSFIELD'S PURCHASE, Township 40, subdivision of lots 22 and 23, with field notes; surveyed, 1822, by Harry Richards.

499 TOTTEN & CROSSFIELD'S PURCHASE, Township 38, in part; filed June, 1876.

500 BLUFF POINT in Raquette lake, Hamilton county.

501 LONG POINT, in Raquette lake, Hamilton county.

502 Map of LAKE GEORGE; 1880, by S. R. Stoddard.

503 TOTTEN & CROSSFIELD'S PURCHASE, Township 40, showing Raquette lake.

504 STATE GORE in Clinton county, 1874, Richards survey.

505 Proposed extension Albany City Water Works; 1868, S. H. Sweet.

506 Boundary Line, KINGS and QUEENS counties; filed May, 1884.

507 Boundary Line between towns of EXETER and BURLINGTON, Otsego county; surveyed by E. E. Beals.

508 Map of Hoyt's Salt block, First ward, Syracuse.

509 Beckwith's cabin, location near Mass.-N. Y. state line, town of Austerlitz, Columbia Co.; 1885, S. F. Balston.

510 State land in Great lots 4 and 5 of PALMER'S PURCHASE, Hamilto Co.; filed Dec., 1884, by Verplank Colvin.

No. MISCELLANEOUS MAPS — Continued

511 TOTTEN & CROSSFIELD'S PURCHASE, Township 3, Hamilton Co.; filed December 26, 1884, by Verplank Colvin.

512 Corner location of BENSON TOWNSHIP, JERSEYFIELD PATENT and LAWRENCE PATENT; map filed by Verplank Colvin.

513 MACOMB'S PURCHASE, Great lot No. 1, Township 20, Franklin Co.; copy from map in Comptroller's office .

514 ROCKLAND county, showing original grants; 1884, Wm. S. Pelletreau.

515 Map of STATE LAND in Buffalo, N. Y.

516 State Salt lots, Third ward, Syracuse; 1886.

517 COHOCTON R. R., old road bed, town of Pembroke, Genesee Co.

518 CONEY ISLAND, town of Gravesend, L. I.; 1885; by Wm. Kowalski.

519 SCIPIO, Lot No. 53, town of Venice, Cayuga county; surveyed April, 1878, by A. A. Horne.

520 SEMPRONIUS, Lot No. 51, Cayuga county; by A. A. Horne, 1878.

521 SEMPRONIUS, Lot No. 61, Cayuga county.

522 Boundary Line between the towns of READING, DIX, HECTOR, MONTOUR, CATHARINE, CATLIN and VETERAN in Chemung and Schuyler counties; 1887, by W. Martin.

523 CONEY ISLAND Common Lands, town of Gravesend, L. I.; surveyed 1878, by William Kowalski.

524 ARTHURBORO PATENT, Hamilton county; filed Oct., 1887.

525 Boundary Line between towns of ANDES and COLCHESTER, Delaware Co.; May, 1887, by Col. W. Martin.

526 BOSTON CORNERS, Columbia Co.; 1853, by J. T. Hogeboom.

527 Boundary Line NEW YORK and NEW JERSEY, Hudson river to Delaware river, established 1884, with report.

528 Survey of State Armory lot at Kingston, Ulster Co.; December, 1887, by H. C. Parsons.

529 Hudson and Mohawk river confluence; 1843, engraved, published by L. Bliss, Lansingburgh; also
Haver, or Peebles, island at mouth of Mohawk; 1860.

530 Fine Salt Lots, Syracuse; B. F. Green's survey, 1858.

531 TOTTEN & CROSSFIELD'S PURCHASE, Township No. 32, Hamilton county; surveyed Oct., 1888, and field notes, by Daniel Lynch.

532 Boundary Line between towns of BERNE and KNOX, Albany Co.; June, 1881, by W. H. Slingerland & Son.

533 Boundary Line between QUEENS and SUFFOLK counties, L. I.; S. V. Whitney and J. P. Jervis, surveyors.

PIER AND BULKHEAD LINES.

MISCELLANEOUS.

534 Lines on east and north shore of Staten Island from Fort Wadsworth to New Brighton; approved by Secretary of War, 1889; established by Chap. 898, Laws of 1895.

535 Line on north shore of Staten Island from New Brighton to dyke opposite Elizabethport, N. J., and south shore of Bergen Neck, N. J.; from East 21st. street, Constable's Point, to First street, Bergen's Point; approved by Secretary of War, 1890; established by Chap. 898, Laws of 1895.

PIER AND BULKHEAD LINES — Continued

No. Miscellaneous — Continued

536 Line on west shore of Arthur Kill, N. J. and west and south shores of Staten Island; approved by the Secretary of War, 1890; established by Chap. 808, Laws of 1895.

537 Line on the west half of the south shore of Staten Island, Sequines Point to Ward's Point; approved, etc., 1890; established by Chap. 898, Laws of 1895.

538 Lines on the shores of Newark Bay, N. J.

539 Line on part of Raritan river and bay.

540 Line in river to head of navigation, Raritan river.

541 Line around Ellis Island in New York harbor.

542 Line on west shore of Hudson river opposite New York.

543 Line on west side of Upper New York Bay, N. J.

544 Line on east shore of Hudson river and north and west shores of the East river from 81st St. to the Battery; also west shore of Hudson river in New Jersey.

545 Line on Hudson river from 81st street to Spuyten Duyvil creek and west shore of East river from 81st street to Port Morris, and both shores of Spuyten Duyvil creek and the Harlem river, around Blackwell's, Randall's and Ward's islands and the Sunken Meadows; 1890.

546 Line on east shore of East river from Fort Hamilton to Buttermilk channel, New York harbor.

547 Line on East river from Buttermilk channel to Ravenswood.

548 Line on East river from Ravenswood to Lawrence Point.

549 Line on East river, Port Morris to Throg's Neck and Lawrence Point to Willett's Point, around Riker's and North and South Brothers islands.

550 Line on East river from Bushwick creek to Grand street ferry.

551 Line in Newton creek from Whale creek canal to Metropolitan avenue; 1890.

552 Bulkhead line, Hudson river, Troy to New Baltimore, Sheet No. 1.

553 Bulkhead line, Hudson river, Troy to New Baltimore, Sheet No. 2.

554 Bulkhead line, Hudson river, Troy to New Baltimore, Sheet No. 3.

555 Bulkhead line, Hudson river, Troy to New Baltimore, Sheet No. 4.

556 Bulkhead line, Hudson river, Troy to New Baltimore, Sheet No. 5.

557 Line on east shore of East river from Newton creek to Bushwick creek in Brooklyn; approved, 1895, by Deputy State Engineer.

558 Line on east shore of East river from Bushwick creek to Grand street; approved, 1895, by Deputy State Engineer.

559 Line on east shore of East river from Grand street to Ann street; approved, 1894, by State Engineer.

560 Line on east shore of East river from Wallabout bay to Fulton street; approved, 1895, by State Engineer.

561 Line on east shore of East river from Fulton street to Atlantic docks; approved, 1895, by State Engineer.

562 Line on east shore of New York harbor from Atlantic docks to Owl's Head; approved, 1896, by Deputy State Engineer.

563 Line on east shore of N. Y. harbor from Bay Ridge avenue to 89th street; approved, 1894, by State Engineer.

PIER AND BULKHEAD LINES — Continued

No.

Miscellaneous — Continued

564 Line from Fort Hamilton to Coney Island, including Gravesend bay; approved, 1892, by the Secretary of War.
565 Line on east shore of East river at Ravenswood, L. I.
566 Line in Harlem river and Spuyten Duyvil creek; by Central Park Commissioners, April, 1867.

ESTABLISHED BY NEW YORK HARBOR COMMISSIONERS.

567 Pot Cove; Hallett's Point; Hell Gate; 1874.
568 Hell Gate and Blackwell's Island; 1875.
569 Blackwell's Island; 1875.
570 Newtown creek; 1875.
571 Dupont to Bushwick creek; 1875.
572 East river at Bushwick inlet; 1857.
573 Grand street to Thirteenth street; 1875.
574 Ford's pier to Marston & Powers' coal yard; 1875.
575 Ford's pier to Atlantic basin; 1875.
576 Atlantic basin to Bay Ridge, Gowanus bay; 1887.
577 Hallett's Point to Willett's Point; 1874.
578 Wallabout bay to Hallett's Point; 1874.
579 Wallabout bay to Atlantic docks; 1875.
580 Atlantic docks to Coney Island; 1875.

MISCELLANEOUS.

581 New York city docks, existing and proposed Pier and Bulkhead lines; 1879.
582 Proposed Pier and Bulkhead lines, Newtown creek and Dutch kills; 1877.
583 City of Yonkers, Pier and Bulkhead lines; April, 1886; also Grants of Land under water.
584 Boundary line between New Jersey and New York, part under water; see State Engineer's report for 1900, page 254.
585 MACOMB'S Purchase, south part, now Lewis, Jefferson and Oswego counties; surveyed 1794, by Will Cockburn.
586 New York state, northwest part; by P. Tardeau, 1816.
587 Map of Township of Lake Pleasant, Hamilton county; blue print of map in Comptroller's office.
588 Map of State Lands, (Ne-ha-sa-ne park) Hamilton and Herkimer Co.
589 Map of the Township of Stockholm, St. Lawrence county; by I. Beman and A. Lay, 1800.
590 Town of Dickinson, township No. 10, Franklin Co.; by W. B. Gilbert, 1841.
592 Proposed pier and bulkhead lines New Brighton to Newark bay, Staten Island; 1879.
593 Proposed pier and bulkhead lines, Fort Wadsworth to Ward's Point, Staten Island; 1879.
594 Staten Island Sound, exterior line of piers from Raritan bay to Newark bay; 1879.
595 Proposed pier and bulkhead lines in Newtown creek; 1877; surveyed by A. Doerflinger.

PIER AND BULKHEAD LINES — Continued

No. Miscellaneous — Continued

596 Long Island Sound, north shore, Delancey Point and Rye Neck; 1837.

597 Map of Third ward, Syracuse, Lots 269 and 270; filed June, 1884.

598 City of Yonkers, Pier and Bulkhead lines, Westchester county; established by United States Government, September, 1897.

599 Map of proposed city of Mt. Vernon, Westchester county; by R. W. Burrows, 1892.

PORTFOLIO A.

600 Survey of land for Thomas Ord; 1775; 5,000 acres in Township No. 27, Totten & Crossfield's Purchase, Tryon county.

601 Survey of land for Mary Airey, Jeffrey Amherst *et al.;* 1774; in Township No. 3, Totten & Crossfield's Purchase, Riverhead township, Tryon Co.

602 Survey of land for Henry Van Vleck *et al.;* 1772; 5,000 acres on Wood creek, 12 miles east from falls, Charlotte Co.

603 Survey of land for John Lawrence, 1772, Chas. Nichols *et al.;* 1,000 acres and 4,000 acres, Charlotte Co.

604 Survey of land for Daniel Van Olinda; 1719; 1,300 acres, Albany Co., on the south side of the Dewathojacks river.

605 Survey of land for J. Van Rensselaer *et al.;* 1774; 28,964 acres and 18,036 acres and allowance, including all islands.

606 Survey of land for R. R. Crow; 1775; 2,000 acres, Tryon Co.; also 2,000 acres for Phineas Atherton, Tryon Co.

607 COXE'S Manor, or HAMDEN township, on Susquehanna river; 1775; 29,812 acres and allowance.

608 Survey of land for Beamsley Glazier; 1772; 3,000 acres; also for W. Franklin *et al.;* 1770; 6,000 acres and allowance on the west side of the Scholiara kill.

609 Survey of land for John Small; 1774; 5,000 acres; also for Eliz. Springer and Francis Legge *et al.*, west of Lake Champlain.

610 Survey of land for James Alexander *et al.;* 1725; 8,000 acres, north of Mohawk river and west of mouth of Canada kill.

611 Survey of land for John Collins; 1714; 2,000 acres; also J. H Fisher; 1716; 700 acres; Samuel and Elizabeth Babington, Henry Barclay and John Wemp on Mohawk river near Fort Hunter.

612 BUTLERSBURY, Albany Co.; 1735; 4,000 acres, includes lands of Walter Butler, Marian Scott and Charles Williams.

613 Survey of land for Myndert Schuyler *et al.;* 1714; 10,000 acres; and Augustus Van Courtland; 1735; 1,270 acres; and J. H. Ten Eyck; 1739; 3,500 acres, on Schoharie creek.

614 Survey of land for James Delancy; 1737; 10,000 acres; also William Corey *et al.;* 25,000 acres and allowance; south side of the Mohawk river, Albany Co.

615 SCHOHARIE Patent, or HUNTERS FIELD; also survey of land for Geo. Clarke *et al.;* 1734; also patent to Myndert Schuyler.
(NOTE.— Nos. 613 and 615 are one map.)

616 Survey of land for Johannis Roseboom, David Provost, William Burnet, Robert Livingston and Archibald Kennedy; 1726–7; about 4,600 acres south of Mohawk river.

No. PORTFOLIO A — Continued

617 Survey of land for William and Lewis York; also Peter Mebee, on the Schohara river, and for Johannis Visger and Hendrick Ten Eyck, south of Mohawk river.

618 Survey of land for Henry Hoofe, 1,083 acres on Mohawk river, and for Wm. York, 1,000 acres, on both sides of Cobus kill.

619 Survey of land for Fred'k Morris *et al.;* 6,000 acres on both sides Mohawk river, west of Cosby's Manor. (1736.)

620 Survey of land for Hans and Hendrick Hensen, 2,000 acres on Mohawk river; and for Charles Williams, 571 acres adjoining.

621 COSBY'S Manor, 42,000 acres on Mohawk river, or land of Joseph Worrell, 22,000 acres, and John Lyne, 20,000 acrès, Albany Co.

622 Survey of land for Pietrus Van Dreissen, 1,000 acres, also for John Van Dreissen, 428 acres adjoining, on Mohawk river.

623 Survey of land for Philip Livingston, William Dick, John Lyne, Frederick Morris and others, near Canajoharie, Albany Co.

624 Survey of land for Lewis Morris, Peter Winne, Chas. Williams and others, west from Fort Hunter, Albany county.

625 Survey of land for Lewis Morris and others; 6,450 acres, on south side of Mohawk river, Albany Co. (1722.)

626 Survey of land for Ab'm Van Horne and others, south side of Mohawk river; surveyed by Robert Harpur. (1731.)

627 Survey of land for Edward Harrison and others, between the Mohawk and Schoharie rivers, adj. township of Schenectady.

628 Survey of land for Timothy Bagley, Alex. Cosby and others, on Schoharie river, 2 lots of 6,000 acres and 8 lots of 1,000 acres. (Joins map No. 630.)

629 LANDS bought of Indians, (1733) by Walter Butler and others, and LANDS bought of Indians, (1734) by Jacob Glen and others; A. and C. Colden, Surveyors-General.

630 Survey of lands for Walter Butler and others. (Joins maps Nos. 628 and 631.)

631 Survey of land for Aaron Bradt. (Joins map No. 630.)

632 Survey of land for John Lindesay, 9,515 acres. (1733.)

633 Survey of land for Philip Livingston and John Lindesay, 3,000 acres, south side of Mohawk river; August, 1736.

634 Survey of land for John C. Weiser *et al.;* 1,637 acres, on the Otsquage creek, 3 miles south of Mohawk river. (1735.)

635 Survey of land for John Butler, William Bauch, Edward Clark, Hendrick Heeger, and others, on Schoharie river.

636 Survey of land for Volkert Oothout and others; 1741; 13,000 acres and allowance near Susquehanna river.

637 Survey of land for Ph. Livingston, Cornelia Schuyler, Henry Holland and others, on Hudson river. (1769.)

638 NORTHAMPTON Patent on Hudson river. (Same as No. 637.)

639 Map of NORTHAMPTON Patent; also the Philip LIVINGSTON Patent, on the Sacandaga river.

640 Survey of land for Lendert Gansevoort *et al.;* 28,000 acres, Sacandaga Patent also part of Kingsboro, James Stewart, 24,000 acres.

No. Portfolio A — Continued

641 Survey of land for Lewis Morris, Johanis Lawyer and others.

642 John Groesbeck's Patent; 1741; 17,000 acres and allowance.

643 Survey of land for Jacob Borst, Goldsbrow Banyar and others, on the Oschaleghe or Cobus kill.

644 Survey of land for Fred'k Young, 20,000 acres on Cobus kill; also for Lawyer and Borst, 7,000 acres.

645 Survey of land for Coenradt and Fred'k Franck; 5,000 acres.

646 Survey of land for Jacob Lansing, Cadwallader Colden and others, on Mohawk river and Otsquage kill.

647 Survey of land for George Klock; 16,000 acres between Canada kill and Garoge kill. (1754)

648 Survey of land for Sara Magin *et al.* (Adjoins map No. 647.)

649 Survey of land for John McNeile *et al.;* 4,000 acres. (1761)

650 Survey of land for Henry (Lord) Holland, Holland Patent, 20,000 acres; also for Hezekiah Sumners, 2,000 acres.

651 Survey of land for John Weatherhead, Blenhiem, 40,000 acres; also for Ury Rightmeyer and others, on Schoharie creek.

652 Survey of land for Ury Rightmeyer; 2,900 acres; two pieces.

653 Survey of land for John Butler, 47,000 acres on Tianaderha creek; also for Peter Middleton, 5,000 acres.

654 Survey of land for Charles Reade, 69,000 acres; and J. C. Hartwick, 21,000 acres. (Adjoins map No. 653.)

655 Survey of land for Philip Livingston and others; 20,000 acres.

656 Survey of land for Henry White, 38,000 acres; and for Thomas Wharton, 30,000 acres, on Coogquago branch of Delaware river.

657 Survey of land for Ab'm Lott, Jr.; 20,000 acres. (Joins map No. 648.)

658 Survey of land for Alex. McKee *et al.;* 40,000 acres. (Joins map No. 636.)

659 Survey of land for Lawrence Kortright, 22,000 acres; also for John Harpur, 22,000 acres; also for Aaron Bradt, 6,000 acres, on the Coogquaga branch of the Delaware river.

660 Survey of land for Stephen Skinner, 40,000 acres; also for Richard Loudon, 13,000 acres; also for J. F. Bauch *et al.*, 3,600 acres, on the Cobus kill.

661 Lands of Sir William Johnson and others, on the Tianaderha branch of the Delaware and Susquehanna. (1770)

662 Pinefield (Rapelya's Patent), for heirs of David Colden, on Delaware river; 1792; by Wm. Cockburn.

663 Survey of land for Alex. McKee, 18,000 acres; also for Edward Tudor, 6,000 acres, on Coogquaga branch of Delaware river.

664 Survey of land for Sir William Johnson; 26,000 acres. (1770)

665 Survey of land for Theobald Young, 14,000 acres; also for John McNeile, 5,928 acres, west and south of Caniaderaga and Otsego lake.

666 Survey of land for David Schuyler; 43,000 acres near Caniaderaga lake.

667 Survey of land for Ebenezer Jessup and others, on Lake George and Hudson river. (1768)

No.

PORTFOLIO A — Continued

668 Lands between Lake George and Hudson river, showing DARTMOUTH Patent, township of HYDE, also QUEENSBURY; lands of Jeremiah Van Rensselaer and others.

669 Part of map No. 668.

670 Map of various grants south of and adjoining map No. 668.

671 Part of map No. 670.

672 Map of LONG POINT on Lake George, Warren county.

673 Map of lands adjoining Lake George near Fort Ticonderoga.

674 Survey of land for Sam'l Adams, Wm. Friend, James Scott and others, on Lake George and Long Island.

675 Survey of land for Robert Kennedy, Richard Kelly & John Armstrong, Hector McKensie and others, Charlotte county, on west side of Lake George.

676 Map of allotment of HYDE township, Warren Co.; April 13, 1811.

677 Survey of land for Joseph Wallon, ARTILLERY Patent, 24,000 acres; Moses Harris and Jonathan Lee. (1788)

678 Survey of land for Robert E. also William Edmeston; also Leonard Lispenard on Tianaderha creek. (1770)

679 Survey of land for George Croghan, 100,000 acres; also for John C. Hartwick, on Otsego and Caniaderago lakes.

680 Map of first tract of BELVIDERE of George Croghan's Patent, Otsego Co.

681 Survey of land for J. N. Mathias, William Bauch, Lawrence Lawyer, Wm. Wood *et al.*, on both sides of Schoharie creek.

682 Survey of land for John Becker and J. Eckerson near Huntersfield.

683 Survey of land for Arent Bradt *et al.*, 2,000 acres; and Walter Franklin *et al.*, 9,000 acres, on the Susquehanna.

684 Map of COXE Patent, 47,000 acres; also Wm. & Rob't Bayard, 50,000 acres, and ORISKANY Patent, on Wood creek and Mohawk river, Oneida county.

685 Map of KINGSBURY, also PROVINCIAL Patents, and various grants adjacent thereto, Washington county.

686 Survey of land for Rudolph Staley's second tract. (1755)

687 Survey of land for John Glen and 44 others, 45,000 acres, between Sacondago and Cayaderoseros Patents.

688 Survey of land for John Butler *et al.*; 24,760 acres. (1771.)

689 Survey of land for John Bowen, 15,500 acres, on the Schoharie creek and Cobus kill.

690 Allotment of COXE's Patent, Oneida county.

691 COXE's Patent, or COXEBOROUGH, Oneida county.

692 Survey of land for Philip Livingston, Arent Stevens, Edward Collins, etc.; adjoins Palmer's Purchase.

693 LONG ISLAND in Lake George, with adjacent uplands, Warren county.

694 Land on upper HUDSON river.

695 Survey of land for Nicholas Sutherland, Alex. McIntosh and others, on Lake Champlain near Fort Ticonderoga.

696 Survey of land for Wm. Guise, 800 acres; also for Frederick Shomard, 200 acres. (1773)

697 Warrant and survey for Wm. Shepard, Joshua Messereau *et al.*, 2,970 acres, between Pittstown and Hoosic Patents, Rensselaer county.

No.

PORTFOLIO A — Continued

698 Survey of land for Thomas Porter, 5,600 acres, Niel McDonald, Peter Garland and others, along North river.

699 Survey of land for various persons on west side of Lake Champlain from Splitten Rock to Perou Bay, Essex county.

(*End of Portfolio A.*)

PORTFOLIO B.

700 Survey of land for John Reed, 3,000 acres; also for Wm. Butler, 3,000 acres, south side of Susquehanna river.

701 Survey of land for Adam Gilchrist and various others, lying east from Skeenesborough Patent, Washington county.

702 Survey of land on east side of Lake Champlain near SIX MILE POINT; land is now in state of Vermont.

703 Survey of land for Jas. Montressor, 10,000 acres; also for Sir John St. Clair, 10,000 acres, and others.

704 Survey of land for Thomas Mason, 200 acres, at Six Mile Point on Lake Champlain near Fort Ticonderoga.

705 Survey of land for various persons on Poultney creek in Vermont, also Socialborough and Skeenesborough.

706 Patent of Martin Garretson Van Buren; July, 1767; 17,940 acres; and various other persons adjoining.

707 Map of KINGSBOROUGH, granted to James Stewart; 1755; 24,000 acres along Garoge creek, Fulton county.

708 Survey of land for Jacob Starnberger and George Zimmer; 8,000 acres; also Johannis Lawyer and various others.

709 Map of STRASBURGH, granted to John Butler, 24,760 acres; also
BLENHIEM, granted to John Weatherhead; and
MIDDLEBURGH, granted to J. Butler, 10,000 acres; and
Grant to Michael Byrne, 18,000 acres.

710 Survey of land for various persons; said to be in Vermont.

711 Survey of land for Jonathan Brewer, 3,000 acres; also for John Butler, 2,000 acres. (1770)

712 Survey of land for Henry Van Vleck, 5,000 acres; also for John Ogilvie, 2,000 acres, adjoining Socialboro, Vt.

713 Survey of land for John Watts, 3,000 acres; D. Smith, 2,600 acres, Crean Brush, 2,400 acres; A. Ogilvie, H. Mitchel and others, on east side of North river.

714 Survey of land for Samuel Adams on Lake George; 500 acres.

715 Survey of land for Martin G. Van Buren, 14,969 acres; also three pieces for Vincent Mathews and others, on Chawtickiquack brook.

716 Survey of land for John Thompson and others; said to be in Vermont.

717 Survey of land for Alex. Turner, 25,000 acres, on the Batten kill, and various others adjoining, Washington county.

718 Survey of land for Thomas Ford, 16,000 acres, on Beaver creek; also for George Robinson, 750 acres, 2 miles from Lake George.

719 Survey of land for Philip Skene, 3,000 acres, on Lake Champlain, Essex county; also for Peter Stewart, 2,000 acres, on same.

720 Survey of land for John Lawrence; 1,000 acres, north of Artillery Patent, Washington Co.

No. PORTFOLIO B — Continued

721 Map of township of PLATTSBURGH, 28,000 acres, on Lake Champlain; also adjoining grant to P. Stewart, 2,000 acres; also J. Friswell, 2,000 acres, and CUMBERLAND HEAD, 2,900 acres.

722 Map of grant to Jellis Fonda, 40,000 acres, in Oneida county; surveyed by G. Lansing.

723 Map of the subdivision of FONDA'S Patent, Oneida county.

724 Land of Theophileat Bache, 14,400 acres, and lands adjoining.

725 DELAWARE river, copied from a map by Metcalfe.

726 Protraction of Isle La Motte, Lake Champlain, Vermont.

727 Land of Theophileat Bache.

728 Land of Wm. Gilleland, called BETTSBOURGH; also of Philip Skene and M. L. Woblesy *et al.*

729 Map of DU BOISE'S tract; from a survey by Wm. Cockburn.

730 Land of Ph. Livingston, 7,000 acres; also the DuBoise tract.

731 Land of Isaac Paris, 2,400 acres; John Zabriskie, 2,500 acres; and Jere. Van Rensselaer, 1,200 acres; in the southwest corner of Palmer's Purchase; by L. Vrooman, July, 1788.

732 PALMER'S Purchase on the Sacondaga branch of Hudson river.

733 Part of map No. 732.

734 Part of REMSENBURG patent, 48,000 acres, north of Jerseyfield.

735 Sketch of land in Steuben township, Oneida Co.; copy of Cockburn's survey.

736 Townships of HAMDEN and SIDNEY, with subdivisions.

737 Townships of CHENANGO, RANDOLPH, etc.

738 Survey of land for Thomas and William Burling; 2,400 acres north of Fonda's Patent on Mohawk river; by L. Vrooman..

739 Patents along the Pennsylvania line, Hooper's tract, Randolph township, etc.

740 Land of Leonard Fisher, 2,095 acres, Montgomery county; west of map No. 738; surveyed by L. Vrooman.

741 Map of GLEN & YATES' Patent on Sacondaga river (Palmer's Purchase); Oct., 1785, by Chris. Peak.

742 Boundary line between New York and Pennsylvania, from the Delaware river to the 90th mile stone; Oct., 1786.

743 Survey of land for Philip Livingston *et al.*, with field notes; June, 1761, by Isaac Vrooman.

744 Canadian and Nova Scotia Refugee Lands, Clinton county.

745 Canadian and Nova Scotia Refugee Lands, Clinton county.

746 Canadian and Nova Scotia Refugee Lands, Clinton county.

747 Map of lands on Lake Champlain near Ticonderoga.

748 Map of part of the Hoosick Patent, Rensselaer county.

749 Map of land along the Hoosick Patent, Rensselaer Co.; 1772.

750 Map of part of Hoosick Patent, Rensselaer Co.; by Bleecker.

751 HOOSICK Patent and PITTSTOWN Patent, and adjacent land, Rensselaer county; also BENNINGTON, Vermont, granted to H. Schneyder, 10,000 acres.

752 Land between Hoosick and Pittstown Patent; 2,495 acres.

753 Land Patents north from the Batten kill. Washington Co.

No. PORTFOLIO B — Continued

754 Map of ROYAL Grant, FOURTH allotment on east side of East Canada creek, now Herkimer county; by L. Vrooman; 1798.
755 Remsen's and Matchin's tracts on Canada creek and Black river.
756 JOHN EVANS' grant, western part, Ulster county near New Paltz; surveyed 1797, by Jonas Smith.
757 Field notes of traverse of Hoosic river; by JOHN MCCLUNG, 1779.
758 Map of PITTSTOWN, Rensselaer county, granted to Isaac Sawyer *et al.*; 1761; also land between Pittstown and Hudson river.
759 Map of lands at Fort Hunter, Montgomery county.
760 Map of Van Bergen's THIRD Tract and adjacent lands; also DIES' Manor; by James Cockburn, 1754.
761 Map of WILLSBOROUGH and adj. lands on Lake Champlain.
762 Warrant and survey of VAN NESS grant on Kinderhook creek, 700 acres, surveyed by John E. Van Alen, March, 1788.
763 Townships of NETTLE FIELD; also BELVEDERE; Otsego county.
764 Map of DUERVILLE, Clinton Co.; 37,800 acres and subdivisions; surveyed 1788, by George Fleming.
(*End of Portfolio B.*)

PORTFOLIO C.

765 Survey of land for John Garnsey; 1,000 acres.
776 Survey of land for John Garnsey, on Susquehanna river.
767 Map of MAMAKATING, Sullivan Co., granted to Catherine Lodge *et al.*
768 MAMAKATING; also land of Henry Wisner, Sullivan county; surveyed by Cor's C. Schoonmaker, Nov., 1789.
769 Map of SADAGHQUEDA Patent, north side of Mohawk river; 1784; forfeited lands of Hugh Wallace.
770 Map of LAKE'S Patent, adjoining the Wallumschack Patent.
771 Land of Arent Van Corlear *et al.;* 1761; same as Lake's Patent.
772 Locations in the Western Country.
773 Map of LYNOTTVILLE, between Goldsboro and Franklin townships.
774 LEVELS from Fort Edward to Wood creek, 1790, and line of proposed canal, Washington county.
775 WALLUMSACK Patent, purchased from Indians, 1731, by Edward Collins, James De Lancey and others, Rensselaer county and Vermont; subdivided May, 1742.
776 LINE from outlet of Salmon river, south 69° east, 35 miles; also from near Oneida lake and Wood creek.
777 Map of ROAD from Fort George to the river Chazy.
778 Map of ROAD from the Oleout to the Cayuga lake.
779 Survey of land for Donald and others; by Vrooman, 1763.
780 Return of survey of land for D. C. Stewart, 850 acres; also for Roderic McLeod, 200 acres, on South Bay, Charlotte Co.; surveyed July, 1772, by Will Cockburn.
781 Map of the township of SCHENECTADY.
782 OLD MILITARY Tract, Outbounds of Township 5, Clinton Co., and Township 8, Franklin Co., surveyed 1799, by R. Cochran.
783 LANDS between Lake Champlain and Lake George.

No.

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784 HASENCLEVER'S Patent on Canada creek, Herkimer Co.; adjoins Cosby's Manor.

785 Peter Hasenclever's 1,000 acres in the Highlands. (1767)

786 Map of the town of MARBLETOWN on Esopus creek.

787 Survey of land for Jesse Woodhull, 1,500 acres in Orange Co.; also for George Bradley and others.

788 Map of the Second Township in Benson.

789 Map of Canadian Refugee lands in Clinton county and township of Mooers on Lake Champlain.

790 Map of BROTHERTOWN, Oneida Indian Reservation, Oneida Co.; surveyed 1795, by Gerrit Cluett.

791 Proposed Town on Niagara river.

792 Map of 29 Lots in the ONEIDA Reservation; surveyed June, 1798, by H. P. Schuyler.

793 Lands near Schroon lake; Platt's Road Patent; Hoffman etc.

794 Survey of land for Platt Rogers and others, on Lake Champlain, Essex county; copied from a map of Platt Rogers.

795 Survey of land for Nathaniel Mallory *et al.;* Clinton Co., 9,973 acres; surveyed Oct. 1798, by Chas. C. Brodhead.

796 Map of GAGE'S Patent with subdivisions, on Canada creek.

797 Map of Grande Isle and Isle aux Foret in St. Lawrence river near Kingston; surveyed 1796, by William Sax.

798 OLD MILITARY Tract, Township 6, Clinton county, and Township 7, Franklin county.

799 OLD MILITARY Tract, Township 3, Clinton Co.; granted to Benj. Birdsall.

800 Map of western part of John Evans' Grant, Delaware county; surveyed 1797, by Jonas Smith.

801 Map of NEW STOCKBRIDGE, Oneida county, and subdivisions.

802 Land of Major Aug. Prevoorst and gore adjoining; 5,000 acres.

803 Map of LOTT'S Patent, also of MAGIN'S patent, on the Canada kill; north of Mohawk river, Montgomery county.

804 Map of Henry Oothout Patent; 16,052 acres, in Montgomery county.

805 Map of land at Niagara Falls, part of MILE STRIP.

806 Map of HOFFMAN Township on Scaroon lake, Essex county.

807 OLD MILITARY Tract; Outbounds of Township No. 6, Clinton Co., and No. 7, in Franklin Co.; surveyed 1799, by R. Cochran.

808 Land of George Burnett and others, near New Paltz; 1797.

809 Land of Ezra L'Hommedieu at head of Seneca lake.

810 Map of land adjacent to Scaroon lake.

811 Lands of Philip Schuyler, with others adjoining.

812 Land at foot of Shawangunk mountains; surveyed July, 1791, by Cor's C. Schoonmaker.

813 Land between Seneca lake and Lake Ontario; a gore in Ontario and Wayne counties.

814 The same as map No. 813.

815 Lands of W. J. Vredenburgh, John Lansing, Jr., and various others, adjacent to Friend's Settlement.

No.

Portfolio C — Continued

816 Survey of land for Andrew Thompson, John Watts, and others; adjacent to Penna. line, near Deposit; by Wm. Macclure.

817 Old Military Tract, Township No. 4, Clinton county; surveyed 1794, by R. Cochran.

818 Onondaga Reservation Outbounds, Onondaga Co.; 1703; 82 square miles.

819 Map of Nichols' Patent, south of Owego, Tioga Co.; 1802.

820 Coxe's Patent, also Hamden Tract, on Susquehanna river.

821 Map showing overlap of Nichols and Coxe's Patents; surveyed June 10, 1810, by Joel Smith.

822 Map of Fort Hunter lands with field notes, Montgomery Co.; surveyed Dec., 1785, by Col. Throop.

823 Same as map No. 821.

824 Map of Marbletown Patent, Ulster county; surveyed Feb., 1720, by Charles Beatty.

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PORTFOLIO D.

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825 Part of Canadian Refugee Lands on Lake Champlain, Clinton Co.

826 Part of the Canadian Refugee Lands, Clinton county.

827 Map of land from the First and Second Christian Parties of the Oneida Indians; bought in 1841, and surveyed by Nathan Burchard.

828 Map of Corporation Lands at Fort Hunter, Montgomery Co.

829 Lands and various grants at Fort Hunter, Montgomery Co.

830 Old Military Tract, Townships 4, 5 and 6, in Clinton county, and 7 and 8, in Franklin county (outbounds); surveyed July, 1794, by R. Cochran.

Military Gratuity Lands in Central New York.

831 Lysander, No. 1, Oswego and Onondaga counties.
832 Hannibal, No. 2, Oswego county.
833 Cato, No. 3, Cayuga county.
834 Brutus, No. 4, Cayuga county.
835 Camillus, No. 5, Onondaga county.
836 Cicero, No. 6, Onondaga county.
837 Manlius, No. 7, Onondaga county.
838 Aurelius, No. 8, Cayuga county.
839 Marcellus, No. 9, Onondaga county.
840 Pompey, No. 10, Onondaga county.
841 Romulus, No. 11, Seneca county.
842 Scipio, No. 12, Cayuga county.
843 Sempronius, No. 13, Cayuga county.
844 Tully, No. 14, Cortland and Onondaga counties.
845 Fabius, No. 15, Cortland and Onondaga counties.
846 Ovid, No. 16, Seneca county.

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No.	Military Gratuity Lands in Central New York — Continued
847	Milton, No. 17, Tompkins and Cayuga counties.
848	Locke, No. 18, Tompkins and Cayuga counties.
849	Homer, No. 19, Cortland county.
850	Solon, No. 20, Cortland county.
851	Hector, No. 21, Tompkins county.
852	Ulysses, No. 22, Tompkins county.
853	Dryden, No. 23, Tompkins county.
854	Virgil, No. 24, Cortland county.
855	Cincinnatus, No. 25, Cortland county.
856	Junius, No. 26, Seneca county.
857	Galen, No. 27, Wayne county.

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859	Map of KINGSBOROUGH and MAYFIELD Patents, Fulton Co	2
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861	Map of part of KINGSBOROUGH Patent, Fulton county	4
862	Map of MAYFIELD Patent, Fulton county; 15,000 acres	4
863	Map of EMBRY'S Patent, with subdivisions, south of Battenkill, Washington Co. and Vermont	5
864	Cadwallader COLDEN'S Tract in northwest corner of Croghan's Patent; surveyed 1772, by Will Cockburn	6
865	Map of KLOCK'S Purchase, MAGIN'S Tract, and HARRISON tract on Mohawk river and Canada creek	7
866	Map of Springfield, or GROOSBEEK'S Patent, Otsego Co.; also Augustine Prevoost's Patent	8
867	Map of ROYAL GRANT, Fourth Allotment, Herkimer Co.; also tract called YANKY BUSH	9
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869	Map of CLIFTON PARK Patent, of Chonendahowa, Saratoga county; by John R. Bleecker, 1765	10
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872	Map of VAN SLYCK Patent at Canajoharie, Albany now Montgomery Co.; surveyed by Isaac Vrooman, (copy)	12
873	Rudolph STALEY'S tract, 34,000 acres, also Conradt FRANCK'S tract 5,000 acres, at Burnet Field, Herkimer county	13
874	Survey of land for William Wood, 2,000 acres on Schoharie river, near Breakabeen also sundry tracts in Johnstown, Fulton county	14

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875	Map of lots in the village of Johnstown, Fulton Co.	14
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877	Map of Wawagenack Patent; Aug., 1743; 43,000 acres, Columbia Co.; copied from J. R. Bleecker's map	16
878	William Cobey's Patent on Schoharie creek, Montgomery Co.	17
879	Map of Stone Arabia Patent, Alexander's Patent, also Depeyster's and Van Slyck's Patent, on Mohawk river and Canada creek, Fulton and Montgomery Co	18
880	Map of the village of Johnstown, Fulton county	19
881	Map of Chuctinunda town on Mohawk river; by J. V. Alen	20
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883	Map of Wallomsack Patent and lands adjoining, Rensselaer Co.	22
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887	Map of Jacob Lansing's Patent, south side of Mohawk river near Canajoharie; by John R. Bleecker	26
888	Kayaderosera Patent, Allotments Nos. 17 to 25, except No. 21, Saratoga county	27
889	Map of Kinderhook Patent, Columbia Co.; by Isaac Vrooman.	28
890	Plan of the village of Johnstown, Fulton Co., on the Cayadutta kill; surveyed 1784, by Jer. V. Rensselaer	29
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898	Oneida Reservation and lands leased to Peter Smith. (Engraved.)	
899	Township of Locke, Lot No. 28; by C. C. Brodhead, Oct., 1822.	
900	Map of lands between Pittstown and Hoosic Patents, Rensselaer Co.; surveyed 1770, by Archibald Campbell.	
901	Map of part of Van Bergen's Purchase, with letter. (1785)	
902	Map of lands east side of Hudson river above Saraghtoge; 10,000 acres; performed Aug., 1734, by Ed. Collins.	
903	Lands on east side of Shawangunk mountains, Ulster county; 733 acres; June, 1782, surveyed by Thos. Palmer.	

PORTFOLIO E — Continued

No. Miscellaneous Maps — Continued

904 Township of DRYDEN, Lot No. 20; by C. C. Brodhead, Oct., 1822.

905 Land of Robert Leake above the Half Moon, Rensselaer Co.; surveyed by Will Cockburn.

906. Totten & Crossfield's Purchase, Township No. 6, Hamilton Co.

907 Map of SCHAGHTICOKE grant, also LEAKE'S grant, on the Hudson river, Rensselaer Co.; by Alex. Colden.

908 Map of SIX Islands in the Battenkill, Washington county; per Will Cockburn.

909 Township of LOCKE, Lot No. 22.

910 Land of Jeremiah Bradway and land of Widow Houck, on Schoharie creek, Schoharie county; 1832.

911 Map of SIX Islands in the Battenkill, Washington Co., also TWELVE Islands in the Hudson, Rensselaer Co.

912 MOOSE RIVER Tract, Township No. 1, Herkimer county; made by Samuel B. Anderson, 1820.

913 Map of the village of Warrenton, Virginia.

914 Totten & Crossfield's Purchase, Township No. 28, Essex county.

915 Proposed division line of the town of Phillips, Westchester Co.; March, 1830, surveyed by Abraham Smith.

916. Survey of land for Col. Howard on northeast branch of Hudson river, north of Lake George; 10,000 acres.

917 Map of the towns of Homer and Cortlandville, Cortland Co.; March, 1830, by Thomas L. Bishop.

918 Tract of Gov. FRANKLIN and others and part of bounds of the Otego tract, with field notes, Otsego county.

919 Land on Hudson river for Joshuah Knockerthalb and others, at mouth of Quassaic creek, Ulster county.

920 Totten & Crossfield's Purchase, Township No. 24, Warren county.

921 Survey of land for Lieut. P. P. Butler, John Taylor, Picter Deyoo and others; July, 1768, by Will Cockburn.

922 Survey of land for James Napier, William Gregor, Duncan McVicar and others; per Alex. Colden.

923 HARPER'S Purchase between the Delaware and Susquehanna.

924 Map of 30 LOTS west of Lake Champlain, and the Isle La Motte.

(*End of Portfolio E*)

PORTFOLIO I.

925 Francis Harrison Tract, 5,000 acres, on Hudson river.

926 Map of 3,898 acres of land.

927 Part of HOOSIC Patent, Rensselaer and Washington counties; Oct., 1770, per Archibald Campbell.

928 Map of the Oneida Indian Reservation in 1810; copied from several maps by James Ferguson.

929 Survey of land for Lieut. P. P. Butler and others (see No. 921); July, 1768, per Will Cockburn.

930 Warrant and survey for Wm. Schut and others, Ulster county; by John Beatty, December, 1709.

No. PORTFOLIO I — Continued

931 Warrant and survey for Severain Tenhout, Ulster county; by John Beatty, November, 1709.

932 Warrant and survey for Col. Jacob Rutse, Ulster county; by John Beatty, April, 1717.

933 Warrant and Survey for Hugo Feve of New Paltz, Ulster county; by John Beatty, May, 1714.

934 Map of the town of CHINA in Genesee county; with field notes, by Eber Holmes, March, 1832.

935 Survey of land for David Prym, 150 acres on Schoharie creek; by Josiah Throop, Dec., 1785.

936 Map of the village of CONSTANTIA, on Oneida lake, Oswego Co.

937 Land granted to Abraham Schuyler, Pittstown Patent, Rensselaer Co.

938 Land granted to John Schuyler on Tomhenock creek, Rensselaer Co.

939 Map of the village of Oswego; April, 1798.

940 Survey of land on west side of Lake George, 3,479 acres; surveyed Nov., 1772, by Stanton Tefft.

941 Survey of land on west side of North West Bay on Lake George, 2,100 acres; surveyed Nov., 1772, by Stanton Tefft.

942 Map of land ceded by the ST. REGIS Indians, 1816 and 1818; Massena, St. Lawrence Co.; surveyed 1832, by Henry Longley.

943 Col. CLAUS' tract in the Mayfield Patent; copied from the original map, 1803.

944 Map of John Monroe's land on Batten kill, Washington Co., 2,920 acres; August, 1765, by Arch. Campbell.

945 Protraction of part of Lake Champlain.

946 Township of LOCKE Lot No. 22, with subdivisions, Cayuga county; surveyed Oct., 1822, by C. C. Brodhead.

947 Map of old and new canal in village of Geddes, Onondaga county; July 6, 1854, by B. F. Green.

948 Map of State land at Syracuse used for salt purposes.

949 Sundry maps, not located.

(*End of Portfolio I.*)

MISCELLANEOUS MAPS.

950 Map of State land in Richmond county, town of Westfield; 1891.

951 Map of State land in Richmond county, town of Castleton; 1891.

952 Boundary line between the towns of Shandaken and Denning, Ulster county; by Wm. Martin, 1892.

953 City of OGDENSBURG, St. Lawrence Co.; 1868, by Henry Wall.

954 Map of Chemung and Tioga counties; by D. H. Burr, 1838.

955 Post Route map; Vermont, New Hampshire and part of Maine.

956 Part of the village of Corning, town of Painted Post, Steuben county; 1836. (Engraved.)

957 Land for Prospect Park, Brooklyn; filed April, 1861.

958 Syracuse lands at lot 49; Lot 39, 278 and 305.

959 City of SCHENECTADY; 1845, by H. F. Flansburg, City Surveyor.

960 Map of MAMAKATING, Ulster Co. (Very old and brittle.)

961 Lands of Henry Mason at Rossville, Staten Island.

962 Map of LANSINGBURGH, Rensselaer Co.; by Luther D. Eddy, 1848.

963 Poplar island in Hudson river, Albany Co.; by Hudson River Imp. Co.

No.

MISCELLANEOUS MAPS — Continued

964 Proposed Harbor line on Niagara river; 1907.
965 Chenango and Unadilla outbounds.
966 Coarse Salt lands at Syracuse, N. Y.
967 Boundary line between New Jersey and New York, in Raritan Bay, as agreed by joint Commissioners; Oct., 1887.
968 Hudson River from Troy to Albany; 1863. (Tracing.)
969 Proposed location of Docks, etc., New York Bay; 1874.
970 Boundary line between New York and New Jersey from the Hudson river to the Delaware river.
971 Map of the Harlem river; by Gen'l Newton, 1876.
972 Map of part of city of New York, about 1803.
973 Pier and Bulkhead line, East river, Oak Point to Hunt's Point; June, 1892.
974 Map of Spuyten Duyvil and Port Morris railroad, Westchester Co.
975 Boundary line between Hamilton and Herkimer counties; 1900.
976 Head of Fourth lake, showing location of Herkimer and Hamilton county line; 1900.
977 Boundary line between Herkimer and Lewis counties; 1899.
978 Macomb's Purchase, Great tract No. 1, Township 21; Lands of Mutual Life Insurance Co.; H. K. Averill, Jr., 1899.
979 Boundary line between Hamilton and Herkimer counties; State Engineer's report for 1900.
980 Boundary line between New York and Massachusetts; State Engineer's report for 1899.
981 Map of town of Forestport, Oneida county.
982 Map of Fish House Shoal in Hudson river, Rensselaer Co.; 1884.
983 Albany county, preliminary geologic map; 1892, by James Hall, State Geologist.
984 No map.
985 Refugee Tract, Lot 252, Clinton Co.; 1848, by Sam'l Shaw.
986 Confluence of the Unadilla and Susquehanna rivers. Chenango Co.
987 Grants of land under water, Richmond county; 1888.
988 Grants of land under water Richmond county; 1888.
989 Grants of land under water, Kings county; 1887.
990 Grants of land under water, Kings county; 1887.
991 City Island and Hart Island, Long Island Sound; 1900.
992 Water grants around City Island, Long Island Sound.
993 Adirondack Wilderness; large scale, part only.
994 U. S. Geological Survey, Index Progress Map; 1898.
995 Geologic Map of N. Y. State; 1842, by Legislative authority.
996 Essex county and surrounding tracts; very old.
997 City of Rochester; 1876, Oscar H. Peacock, City Surveyor.
998 Post Route map of New York State; 1889.
999 Map of the Catskill Forest Preserve; 1899.
1000 Map of railroad from Valparaiso to Santiago, Chili, South America; 1852.

PORTFOLIO G.

No. UNITED STATES COAST SURVEY CHARTS.

1001 Lake Erie and Ontario with part of Lake Huron and Georgian Bay; 1895.
1002 Lake Erie; published in 1880; scale, 1:400,000.
1003 Lake Erie, chart No. 1, Buffalo to Dunkirk; 1880; scale, 1:80,000.
1004 Lake Erie, chart No. 2, Dunkirk to Erie; 1878; scale, 1:80,000.
1005 Niagara Falls; published in 1885; scale, 1:20,000.
1006 Lake Ontario; corrected to August, 1900; scale, 1:400,000.
1007 Lake Ontario, chart No. 1; corrected to Oct, 1900; scale, 1:80,000.
1008 Lake Ontario, chart No. 2; corrected to June, 1892; scale, 1:80,000.
1009 Lake Ontario, chart No. 3; corrected to Jan., 1899; scale, 1:80,000.
1010 Lake Ontario, chart No. 4; corrected to Jan., 1899; scale, 1:80,000.
1011 Lake Ontario, chart No. 5; corrected to June, 1892; scale, 1:80,000.
1012 St. Lawrence river, chart No. 1; Jan., 1893; scale, 1:30,000.
1013 St. Lawrence river, chart No. 2; Nov., 1892; scale, 1:30,000.
1014 St. Lawrence river, chart No. 3; July, 1897; scale, 1:30,000.
1015 St. Lawrence river, chart No. 4; Aug., 1896; scale, 1:30,000.
1016 St. Lawrence river, chart No. 5; Oct., 1900; scale, 1:30,000.
1017 St. Lawrence river, chart No. 6; July, 1900; scale, 1:30,000.
1018 Lake Champlain, sheet No. 1; 1883; scale, 1:40,000.
1019 Lake Champlain, sheet No. 2; published 1879; scale, 1:40,000.
1020 Lake Champlain, sheet No. 3; published 1879; scale, 1:40,000.
1021 Lake Champlain, sheet No. 4; published 1880; scale, 1:40,000.
1022 Lake Champlain, Plattsburg and Cumberland; 1873; scale, 1:16,000.
1023 Lake Champlain, Burlington, Vt.; 1872; scale, 1:16,000.
1024 Hudson river, east side, Croton to Peekskill; 1878; scale, 1:10,000.
1025 Hudson river, New York to Haverstraw; 1865; scale, 1:60,000.
1026 Hudson river, Haverstraw to Poughkeepsie; 1861; scale, 1:60,000.
1027 Hudson river, Poughkeepsie to Hudson; 1863; scale, 1:40,000.
1028 Hudson river, Hudson to Troy; 1863; scale, 1:40,000.
1029 New York entrance; published in 1875; scale, 1:40,000.
1030 New York Bay and Harbor; corrected to 1892; scale, 1:40,000.
1031 Long Island, west part, south coast; 1851; scale, 1:80,000.
1032 Long Island, middle part, south coast; 1892; scale, 1:80,000.
1033 Long Island, east part, south coast; 1857; scale, 1:80,000.
1034 Long Island, Gardiners Bay; published 1894; scale, 1:40,000.
1035 Long Island, Jamaica Bay and Rockaway Inlet; 1895; scale, 1:25,000.
1036 Long Island, Triangulation, New York to Point Judith; 1873; scale, 1:400,000.
1037 Long Island Sound, Montauk Point to New York; July, 1892.
1038 Long Island Sound, western part; published 1855; scale, 1:80,000.
1039 Long Island Sound, middle part; published 1855; scale, 1:80,000.
1040 Long Island Sound, eastern part; corrected to 1877; scale, 1:80,000.
1041 Long Island Sound, Throg's Neck to New Rochelle; 1894; scale, 1:15,000.
1042 Long Island Sound, Rye Neck to New Rochelle; 1894; scale, 1:10,000.
1043 Long Island Sound, Little Captain Island to Rye Neck; 1897; scale, 1:10,000.

PORTFOLIO G — Continued

No. United States Coast Survey Charts — Continued

1044 Long Island Sound, Plum Island to Stratford Shoal; 1892; scale, 1:80,000.

1045 Long Island Sound, New Rochelle to Manursing Island; 1892; scale, 1:15,000.

1046 Harbors of Captains Island East and Captains Island West; published in 1849; scale, 1:40,000.

1047 Fishers Island Sound, Conn.; corrected to 1879; scale, 1:40,000.

1048 Lake Champlain, sheet No. 2; published in 1874; scale, 1:50,000.

1049 Lake Champlain, sheet No. 1; published in 1874; scale, 1:50,000.

1050 Long Island, Fire Island Beach to Rockaway Beach; published in 1898; scale, 1:80,000.

(*End of Portofolio G.*)

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1051 Post Route map of New York State; 1903.

1052 City of COHOES, N. Y.; 1873.

1053 City of BINGHAMTON, N. Y.; 1891.

1054 City of SYRACUSE, N. Y.; 1882.

1055 ADIRONDACK Forest Preserve; 1893.

1056 ADIRONDACK Forest Preserve; 1895.

1057 Vicinity of Wheeling, W. Va. and Ohio river.

1058 City of ALBANY, N. Y.

1058-a Geological map of New York State; 1894.

1059 Town of BRANDON, Franklin county, Township No. 17; as surveyed in 1800 by Benjamin Wright.

1060 Town of DICKINSON, Franklin county, Township No. 7; as surveyed in 1829 by James Frost.

1061 Town of DICKINSON, Franklin county, Township No. 10; as surveyed in 1841 by W. B. Gilbert.

1062 Town of DICKINSON, Franklin county, Township No. 16, or Johns Manor; surveyed in 1800 by Benjamin Wright.

1063 Town of LORRAINE, Jefferson county, Township No. 1; as surveyed in 1801 by Benjamin Wright.

1064 Town of MARTINSBURGH, Lewis county, Townships No. 4 and 5; as surveyed in 1805 by Benjamin Wright.

1065 Town of OSCEOLA, Lewis county, Township No. 8; as surveyed in 1805 by Benjamin Wright.

1066 Town of OSCEOLA, Lewis county, Township No. 13; as surveyed in 1797 by Benjamin Wright.

1067 Town of WEST TURIN, Lewis county, Township No. 2; as surveyed in 1797 by Benjamin Wright.

1068 Town of WEST TURIN, Lewis county, Township No. 3; as surveyed in 1805 by Benjamin Wright.

1069 Town of BOYLSTON, Oswego county, Township No. 6; as surveyed in 1805 by Benjamin Wright.

1070 Town of GREENBORO, Oswego county, Township No. 7; as surveyed in 1802 and 1805 by Benjamin Wright.

No. **Miscellaneous Maps — Continued**

1071 Town of Orwell, Oswego county, Township No. 11; as surveyed in 1797 by Benjamin Wright.

1072 Town of Sandy Creek and part of Richmond, Albion and Orwell, Oswego Co., Township No. 10; surveyed 1797, by B. Wright.

1073 Town of West Turin, Oswego county, Township No. 1; as surveyed in 1797 by Benjamin Wright.

1074 Town of Pierrepont, St. Lawrence county, Township No. 3; as surveyed in 1806 by Benjamin Raymond.

1075 Map of Upper and Lower Canada, by Thomas Kensett, from MSS. of P. Tardieu, 1812.

1076 Certified copy, northern part of U. S. Cantonment farm; 1843.

1077 Map of Northern New York; by Amos Lay, 1812.

1078 Map of Galloe, Calf and Stony islands, in Lake Ontario; Sept., 1817, by C. C. Brodhead.

1079 Map of 7,297 acres, east part of Township 5 (Martinsburgh), called the triangle, Lewis Co., belonging to Walter Martin; as surveyed May, 1804, by Werden Hammond.

1080 Map of the late Cayuga Reservation; surveyed into lots of 250 acres; Anno 1795.

1081 Macomb's purchase, Great Lots Nos. 1, 2 and 3, Franklin and St. Lawrence counties; as surveyed by Benjamin Wright 1799 and 1800; *fac simile* copies of original note books filed in County Clerk's office, Canton, N. Y.

1082 Harwood, Township of, southeast quarter, St. Lawrence Co.; surveyed by W. H. Corey, 1902. (Canal Clerk's No., 2501A.)

1083 Water Front, city of Buffalo; 1903.

1084 Village of Elmira; 1838, by Mortimer G. Webb.

1085 Village of Elmira. (Engraved.)

1086 New York State, showing ancient land grants.

1087 Suffolk county; preliminary for Bien's atlas.

1088 City of Albany, N. Y.; 1902. (Engraved and mounted.)

1089 City of Syracuse, N. Y.; 1873. (Engraved and mounted.)

1090 Village of Nyack, Rockland Co.; 1902. (Printed.)

1091 County of Saratoga; 1890.

1092 Pier and Bulkhead line, Alexandria Bay, N. Y.; 1902.

1093 Pier and Bulkhead line, modified at Smoky Point, S. I.; 1905.

1094 Pier and Bulkhead line, modified at Long Island City; 1898.

1095 Pier and Bulkhead line, modified around Riker's island; 1894.

1096 Pier and Bulkhead line, modified around Berrian island; 1903.

1097 Salt vats at Syracuse. (Tracing.)

1098 State Reservation at Oswego Falls. (Tracing.)

1099 Town of Pelham, Westchester Co.; 1798. Copy of map No. 404.

1100 Boundary line between Orange and Rockland counties, at the Hudson river.

1101 Map showing proposed canal between Newtown creek and Flushing bay, Queens county.

1102 Old Military Tract, Township No. 11. Copy of map No. 302, in office of the Secretary of State.

No. MISCELLANEOUS MAPS — Continued

1103 MACOMB'S Purchase, Great Tract No. 1, Township 20, Franklin county; purchased by A. Hutchins.

1104 TOTT. & CROSS. PURCHASE, Township No. 1, southeast quarter; Wells, Hamilton county. (Tracing.)

1105 Map of south part OXBOW Tract, Hamilton Co.; by D. McMartin, Jr., 1829.

1106 Allotment of LAWRENCE Patent and adjoining lands, Hamilton county; by J. B. Koetteritz.

1107 MACOMB'S Purchase, Township No. 27, Franklin Co.; by Colvin, 1897.

1108 QUEENS Borough, 2nd, 3rd and 4th wards; 1905.

1109 QUEENS Borough, second ward, Newtown.

1110 Boundary line between ST. LAWRENCE, FRANKLIN, HERKIMER and HAMILTON counties.

1111 Boundary line between CANADA and New York; 1902. (Blue print.)

1112 Boundary line between ESSEX and WARREN counties; copy of map No. 346, in office of Secretary of State.

1113 Boundary line between WARREN and WASHINGTON counties; 1905.

1114 Land Patents on STATEN ISLAND; 1668 to 1712; compiled from records in office of the Secretary of State by C. D. Burrus.

1115 WATKINS GLEN and adjacent lands, Schuyler Co.; 1900, by John R. Kaley.

1116 Commissioners Map of Brooklyn, N. Y.

1117 TOTT. & CROSS. PURCHASE, north line; by D. M. Arnold, 1866.

1118 PORT CHESTER harbor and Byram river, Westchester Co.; 1901.

1119 Pier and Bulkhead line around Manhattan; 1902.

1120 Pier and Bulkhead line, Port Morris to Throg's Neck and Lawrence Point to Willett's Point; 1891.

1121 Pier and Bulkhead line at HASTINGS, Westchester Co.; 1907.

1122 Province of NEW YORK; by Sauthier, 1779.

1123 Lands under water, for J. A. Cross, Brooklyn, N. Y.

1124 Terminal, Champlain and St. Lawrence railroad, at Rouses Point, Clinton county, N. Y.; 1851.

1125 Lands under water at New Brighton, Staten Island, N. Y., for Griffin, Griswold and Green; 1851.

OLD STATE ROADS.

Atlas 'A'

From Bath to Kingston, via Binghamton and Deposit.

Atlas 'B'

From Bath to Catskill, via Florence, Oxford and Unadilla.
Madison village to Athens.
Head of Delaware, via Mina Kill and Gilboa to Cairo.

Atlas 'C'

From Dunkirk to Genesee river, via Lodi and Springville.
Portland to Angelica, via Westfield and Ellicottville.
Angelica to Bath, via Graves Corners and Kenedy village.
Mayville to Little Valley, via Jamestown.

Old State Roads — Continued

Atlas 'D'

- From Angelica to Painted Post, via Hornellsville and Canisteo Valley.
- Sidney Plains to Delhi and Kingston, via Walton and the Esopus kill.
- Woodstock route to the village of Kingston.
- Franklin to Kingston, via Platner brook and Little Delaware.
- Liberty to Newburgh, via Walden.
- Wawarsing to Poughkeepsie, via Old Platz.
- Shohocken to Nyack, via Delaware river and Suffern.

Atlas 'M'

- From Catherine to Lisle, via Spencer and Berkshire.
- Lisle to Sidney, via Greene and North Bainbridge.
- Unadilla to Milfordville, via Huntsville.
- Lisle to Oxford, via Smithville.
- Oxford to Milfordville.
- Milfordville to Gilboa, via New Danbury and Jefferson.
- Harpersfield to Mina Kill.
- Harpersfield and Windham route.
- Log Store in Lisle to North Bainbridge, via Chenango Forks.
- Padget brook route.
- Caroline to Oxford, via McDonough.
- Virgil and Harrison to Smithville, via Union village.
- Binghamton to Harpersfield, via Osborn Hollow.
- Head of Seneca lake to Ithaca, via Perry village.

MISCELLANEOUS BOOKS, MAPS AND DOCUMENTS.

Maps of the United States Geological Survey, in portfolios, Nos. 1 to 7, with special index.
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Europe, map of central part; by Guyot.
Hudson river, Troy to Hudson.
Lakes and head waters of the East Canada and Garoga creeks.
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Onondaga Salt Springs Reservation; by Randall, 1821.

MISCELLANEOUS BOOKS, MAPS AND DOCUMENTS — Continued

Railroad, proposed in northern New York.
Sodus Bay, proposed canal.
Water Grants in New York city; 1873.
United States, Canada and Mexico; by O. D. Case, 1874.
United States and Canada railroad map; by POOR, 1857.
United States; map by GUYOT.
WORLD; by COLTON.

COUNTY ATLASES.

Albany and Schenectady counties; 1866, by Stone & Stewart.
Allegany county; 1869, by D. G. Beers & Co.
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Cayuga county; 1875, by Watkins & Jewett.
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Fulton county. (See Montgomery.)
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Greene county; 1867, by Beers, Ellis & Soule.
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Oneida county; 1874, by D. G. Beers & Co.
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Wyoming county. (See Genesee and Wyoming.)
Yates county; 1876, by Everts, Ensign & Everts.

HOLLAND LAND COMPANY'S PAPERS.

636 Field Books Nos. 1 to 662, inclusive, of which the following are missing: Nos. 1, 59, 60, 61, 62, 63, 84, 150, 151, 194, 195, 249, 368, 375, 376, 377, 378, 458, 509, 534, 535, 580, 581, 582, 613. Contained in 39 tin cases numbered 1 to 39, inclusive.

No.
217 Book of Deeds, Wilhem Willink and others to Charles E. Dudley, with diagrams.
218 to 223, inclusive.
Six books of maps. Not paged or indexed.
224 Scrap book.
225 Field book of 176 lots in Range 1 to 12; surveyed for Andrew Craigie, 18,128 acres, by Amos Lay, July, 1806.
226 Field notes of lots in Townships 12 and 13, Ranges 2 and 3; also Lots in Genesee county and other field notes; copied from the original notes of the Ogden Co.
227 Field notes of line between Townships 13 and 14, Ranges 1, 2, 3, and 4.
228, 229, and 230 NIAGARA Ship Canal.
231 Mutilated book of Towns 2, 3, 4, and 5; sections 4–6, 7–8, etc., and field notes.
232 HUNT Trust, Vol. 8, Scrap book, transcript of deeds with diagrams.
233 Field notes, Connecticut Tract; by David Finley, Oct., 1809.
234 to 240 inclusive.
Seven volumes, Transcript of Deeds, with diagrams. (Not indexed; not alphabetical; not geographical.)
241 to 263, inclusive.
23 volumes, Ledger accounts with Purchasers. (Indexed by name.)
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267 to 291, inclusive.
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Walker's International Atlas of the World; 1890; H. B. Walker.
Herkimer county atlas, by The Century Co., 1906.
Three volumes in water colors of the boundary line monuments of the line between New York and New Jersey; also between New York and Pennsylvania.
Map of the Adirondack Forest Preserve.
Map of the Catskill Forest Preserve.
Geological Map of New York State.
Post Route Map of New York State.
RETURN of Surveys; Volumes 1, 2, and 3.
Abstracts of Patents; Vols. 1, 2, 3, 4, and index.
ORIGINAL Sales books; Vols. 0, 1, 2, 3, 4, 5, 6, 7, and index.
Certificates for Original Sales; Vols. 1, 2, 3, 4, 5.
Certificates of Conditional Resales; Vols. 1, 2, 3.
Certificates and Bonds for Absolute Resales; two volumes.
Certificates and Bonds for land acquired under Foreclosure of Mortgages; Vols. 1, 2, and 3.
RESALES under Law of 1836.
Bonds received and delivered.
Applications for Land.
SURVEY GENERAL'S OFFICE: Day Book; Letter Book; Brief Book; Cash Books (3) and Quit Rent Diary; also Index to old books.
Miscellaneous Certificates of sale; 1786.

MISCELLANEOUS VOLUMES — Continued

Two packages Deeds and Leases; **ROBERT LEAKE** papers.
Minutes of Boundary Commission, New York and Connecticut.
Survey of Coarse Salt Lands at Geddes; by D. E. Whitford, 1879.
Statement of Land sold, 1823 to 1867, belonging to SCHOOL FUND.
Hudson river dredging; 1878, 1879, 1880 and 1881.
Commissioners of the Land Office: Annual reports from 1882 to 1910, inc.
State Engineer and Surveyor: Annual reports from 1882 to 1910, inc.
SALES BOOKS, showing Original sales also Resales of Land; 5 volumes with card index.
Grants of Land under water; 20 volumes.
Twenty-nine volumes of Miscellaneous papers, maps, etc., with card index.
Fifty-two volumes of FIELD NOTES of Patents and Grants of Land.

Report of the Cayuga and Seneca Canal Survey

Report of Resurveying the Blue Line

Report of the Cayuga and Seneca Canal Survey.

ALBANY, N. Y., *October* 1, 1910.

Hon. FRANK M. WILLIAMS, *State Engineer and Surveyor,*
Albany, N. Y.:

Dear Sir.—The following is a report of the work done on the Cayuga and Seneca canal during the past fiscal year.

The surveys begun in the summer of 1909 were continued through the past year. Under chapter 433, Laws of 1909, there was an appropriation of $20,000 "for the State Engineer and Surveyor, for detailed survey, estimate and plans, so far as may be necessary for improving the outlets of Cayuga and Seneca lakes so as to render said lakes and their outlets a part of the Barge canal system of the state."

Also by the approval of the following proposition by the people at the State election of 1909 the appropriation for making the improvement became available, making it possible to continue the work on the surveys and plans without interruption. Chapter 391, Laws of 1909, was entitled "An act making provision for issuing bonds to the amount of not to exceed seven million dollars for the improvement of the Cayuga and Seneca canals, and providing for a submission of the same to the people to be voted upon at the general election to be held in the year nineteen hundred and nine."

In the State Engineer's report for 1909 a description of the work done up to October 1, 1909, was given, also an outline of the work remaining to be done to complete the surveys. After these routes were surveyed, as outlined last year, the following additional surveys were made:

Seneca River Route — East and West Line.

On the line connecting Cayuga and Seneca lakes a stadia survey was made for another line, which would leave Seneca river at a point about one-half mile west of the village of Waterloo and, passing south of Waterloo and south of the village of Seneca Falls, would reach Cayuga lake about one mile south of the New York Central railroad bridge. Wash drill borings were taken along this line.

Cayuga Canal from Cayuga Lake to Montezuma.

This line extends from the deep water of Cayuga lake, which is about five miles south of the village of Cayuga, north through the lake to the outlet and down the Seneca river to Barge canal contract No. 46, joining it near the north end of Kipp island. A taped base line was put in along the east shore of Cayuga lake and along the east bank of the river. Soundings were taken in the river and in the lake next to the east shore. Wash drill borings and drive rod soundings were taken along this route.

Line from Seneca Lake North.

The surveys of the lines from Seneca lake to the Barge canal near Lyons were completed, as outlined in last year's report. Wash drill borings were taken along the entire route from Seneca lake to Creager's bridge. In addition to these lines a new one was surveyed from the northeast corner of Seneca lake through Gem pond and Phillips pond, joining the first survey near Thompson's station.

A survey for a feeder for a summit level to supply water from Canandaigua outlet was made from a point near West Junius along the south bank of the outlet to the village of Phelps.

Several routes were surveyed from Seneca lake north, passing through or around Geneva and joining the original survey at points from one to two miles north of the lake.

The work of making plans and estimates for the various routes was transferred to the Albany office from the field office on December 1, 1909, and preliminary estimates for the various lines considered were submitted to the Advisory Board of Consulting Engineers on April 15, 1910. After looking over the proposed routes on the ground and considering the estimates and profiles submitted, the Board asked for an additional survey, running from the foot of Seneca lake north along a line east of and parallel to the Pennsylvania division of the New York Central railroad to the Barge canal near Creager's bridge. Surveys and estimates were made as requested and submitted to the Board on June 27, 1910. At this date the Board has not made any recommendation as to the line to be adopted. As soon as this recommendation is made, we shall proceed with the finished plans and estimates and I believe that bids can be invited on this work within two months from the date of the adoption of the route.

The plans for the improvement of the Cayuga canal from Montezuma to deep water in Cayuga lake are practically completed. The elevations adopted for the water surface of Cayuga lake, which it is proposed to regulate within two and one-half feet, are as follows: High navigable stage, 384.0; low navigable stage, 381.5; extreme low water, 380.0.

Very truly yours,
H. W. DEGRAFF,
Deputy State Engineer.

Report of Resurveying the Blue Line.

Albany, N. Y., *September* 30, 1910.

Hon. Frank M. Williams, *State Engineer and Surveyor, Albany, N. Y.:*

Dear Sir.— Chapter 199 of the Laws of 1910, entitled, "An act to provide for the mapping of certain canal lands and the lands adjacent thereto belonging to the state," appropriated the sum of twenty-five thousand dollars for this work and directed the State Engineer to make the necessary surveys, field notes and manuscript maps of all such portions of the Erie, Oswego and Champlain canals and of all of the lands adjacent thereto or connected therewith. The only official map of the canal lands at the present time is the map certified by the Canal Commissions in 1834. The purpose of this act was to reëstablish the boundary line, or "blue line," of the State's canal lands, portions of which this Department is constantly called upon to establish in determining claims against the State, in making new land appropriations, etc.

Before the field work was begun a careful search was made of the Department records of blue line surveys by Resident Engineer Wildes, who submitted the following:

"(1) The notes and maps of about 1834 (scale, 2 chains = 1 inch), certified to by the Canal Commissioners and filed in the Comptroller's office. These show the original canals of 4 feet depth and are the only certified maps or records of the blue line.

"It is thought that these notes are not the original field notes, but copies. Many other notes of the blue lines of the original canal, however, are on file in the State Engineer's office. Not any of these records are likely to aid much in establishing present boundaries, as the base lines and the appropriation lines of the enlarged canals were generally very different from the lines of the original canals and the ties between the two series were not frequent.

"There is, however, on the signed vouchers pasted in the official note books of 1834, an explanation of the manner in which the blue line was laid out in general and in more specific cases. A transcript of this explanation would be valuable, especially if it could be proven that the same rules governed in the case of later surveys.

"(2) The maps of about 1869 (scale, 2 chains = 1 inch), filed in book form in the State Engineer's office and showing the enlarged prism superimposed on the original prism.

"Mr. Burrus made the maps for the Eastern Division from numerous older maps (principally from what he terms 'Choppe's' map). He occasionally resorted to field notes, but no new surveys were made for the purpose. The field notes on which these various maps were based cannot be found, though some if not all of the original maps are on file in the State Engineer's office.

"On the Western Division the late J. Nelson Tubbs made the maps of this date and undertook some new surveys distinctly for this purpose. I am informed that the original notes are available.

"In the Middle Division the notes on the Oswego canal are reputed to be lost and I think the same may be said of the books on the Erie, as I have understood from Mr. D. E. Whitford that at Middle Division books were sent to Albany for the 'Tilden Investigation' and never returned. Mr. P. H. Dater informs me that the Attorney-General has made search, but is unable to find the material submitted at this time.

"(3) The rolled maps (scale, 100 ft. = 1 inch), also filed in the State Engineer's office and showing, in addition to much of the information from the earlier sources, the base line and topography of the 'Nine Million' surveys and any adjoining parcels of land more recently acquired. These maps are probably the most valuable compilation existing, but so far as relates to the blue line, they are for the most part mere copies of the earlier maps, and farther removed by so much from the original data. It is thus very desirable to locate, if only for purpose of evidence, the original blue line notes of the enlargement period.

"(4) In addition to the maps and of first importance in establishing lines to which they relate, are any records of deeds, appropriations, settlements, sales and abandonments to be found in the offices of the State Engineer, the Comptroller, the Court of Claims or the various county clerks of the state.

"*Magnetic Bearings.* All surveys on which the maps of 1834 were based were apparently compass surveys and all recorded bearings are magnetic bearings, read to the nearest quarter degree. I understand that in the surveys of the enlargement magnetic bearings were also used.

"I have been able to find no records of magnetic declinations, and the magnetic north point only is shown on the early maps. The dates of the surveys for the enlarged canal range from about 1835 to 1860. In a general way, the eastern part was built first and the western part later and I am informed that the blue line surveys were made after and not before nor during construction. Nevertheless, from the uncertainty of the data it would seem hardly necessary to spend much labor on an investigation of the magnetic declination.

"In a field book of 1875 I find the following note: 'Variation — magnetic needle taken at 3 minutes per year. Total variation since 1830 = 2°–12′.' Of course, the secular variation, like the declination itself, is a variable for different localities.

"*Conditions of the Various Surveys.* On the first surveys, of about 1834, bearings were evidently read successively from point to point without the use of regular curves. On the surveys for the enlargement the preliminary field notes and the equal deflections employed indicate the use of regular curves.

"The field notes of the 'Nine Million' survey are available in the State and Division Engineer's offices. I am informed that in the Middle Division the base lines of this survey were run with transit and measured with steel tape and marked at every even station and every P. C. and P. T. with iron 'harrow-teeth,' about 10 inches long and ¾ in. square, having slightly enlarged heads. The measurements to the inner angle, etc., were made with metallic tapes and the location of buildings was done by stadia.

"Since on these surveys canal structures were located with reference to the new base line, few structures or points remain from which to 'pick up' the old (inner angle) base line. No record, except the old construction note books or final estimate books, is available for determining what changes have been made in these structures. The inner angle of the 9-foot canal, while theoretically following the old base line, varies materially from it. At many points, especially in the cities where the land is of greatest value, vertical walls replaced slope walls. Curves were often 'trued' up by eye from the inner angle, as it then existed, and repairs by the Superintendent of Public Works have been made without record. In addition to all this uncertainty, the old measurements have often been found in error and are at best rough in character."

The field work has been started under the direction of Assistant Engineer Hilborn, who started the work near Rexford Flats on June 1. It is proposed later to place another party in the field.

In retracing the old blue line the general method followed has been to first run a base line on the tow-path, tying on to the Barge canal base line wherever possible, and then to retrace the old "red line" along the inner angle of the canal, as nearly as possible. The angles along this old red line were obtained by compass bearings and errors both in direction and chaining are frequently found and the relocation of this line has proved to be a slow and tedious operation.

The base line was started at the upper Mohawk aqueduct and up to the present time it has been run to State street, Schenectady, a distance of 4.15 miles. The red line, or inner angle line, has been run to Jefferson street, Schenectady. This red line is the base line of the old surveys and, as it did not refer to a monumented base line when originally run, it is impossible to discover an error of measurement or bearing until the attempt is made to retrace it on the ground. This trouble will not occur in the future, as the red line, as relocated, has been tied on to the base line at least every fourth mile.

The work was started by getting the correct bearings of the inner angles of the aqueduct and noting a difference between the obtained bearing and the bearing as shown on the old blue line map. This variation has been changed from time to time, as checking on old property lines and following the inner angle of the canal has made it necessary. It has also been necessary to lengthen or shorten the line as shown on the old map at various times in order to check up on old structures. At several points vertical walls built since the original line was run have thrown the red line out into the canal, making it necessary to run auxiliary lines.

The blue line is located from the red line by offsets, which are perpendicular to it when the red line is a tangent. Where red line angles occur, the offsets are located from a line bisecting the angle. The blue line has been staked out from the aqueduct to the culvert under the canal north of Nott street, Schenectady.

Topography in the vicinity of the canal, especially property lines, has also been taken.

It is contemplated at an early date to monument the blue line and also the base line above referred to.

Respectfully submitted,

H. W. DEGRAFF,
Deputy State Engineer.

Reports on State Boundary Lines

New York-Connecticut Boundary Line

New York-Massachusetts Boundary Line

Report on State Boundary Lines.

ALBANY, N. Y., *September* 30, 1910.

Hon. FRANK M. WILLIAMS, *State Engineer and Surveyor,*
Albany, N. Y.:

Dear Sir.—Chapter 513 of the Laws of 1910, appropriated the sum of ten thousand dollars for the expense of making examinations, surveys and maps, for restoring and placing monuments on the boundary lines of the state.

Pursuant to chapter 59, of the Laws of 1909, this act permitted the work of resurveying and remonumenting the New York–Connecticut boundary line, which was not completed in 1909, owing to lack of funds, to be resumed. The work is now nearly completed and the detailed report of the same, made by Assistant Engineer A. T. O'Leary, is herewith submitted. The report of the work done on this line to October 1, 1909, was included in your annual report for that year.

Acting under chapter 678 of the Laws of 1892, which provides that an examination shall be made every three years of the boundary lines of the state, an examination has been made of the line between this state and the state of Massachusetts. The monuments on this line were found to be in good condition, with the exception of six stones, which had been heaved by the frost and which will be reset later in the year. The above work was done in conjunction with the authorities of the state of Massachusetts and a detailed report of the examination follows.

Respectfully yours,

H. W. DEGRAFF,
Deputy State Engineer.

New York-Connecticut Boundary Line.

October 1, 1910.

Hon. H. W. DeGraff, *Deputy State Engineer, Albany, N. Y.:*

Sir.— I submit herewith a report on the work of resurveying and remonumenting the New York–Connecticut boundary line.

On October 1, 1909, the survey of the line had been completed to old bound No. 43, which is situated about northeast of Brewster, N. Y. From this point the work was carried on during the months of October, November and December to old bound No. 22, which is near Kent, Connecticut, where the work was suspended for the season, owing to the heavy fall of snow. From October 1 to December 24, 1909, therefore, the line was cleared and run and topography taken for a distance of about 20 miles.

In December, 1908, the triangulation work had been suspended at a point about 14 miles northerly from the Ridgefield angle. By October, 1909, the traverse party had reached this point and the triangulation party was again put in the field, under the direction of Mr. E. E. Pierce, and by December 1 the remainder of the line north had been included in the triangulation system.

The monument setting party was at work till November 20, 1909, and from October 1 of that year till work was suspended for lack of funds, new monuments had been set from near Dukes Trees at old bound No. 90, along King street, to Port Chester, to the "Great Stone" at the "Wading Place," or No. 99, on which point a new monument was erected in a footing of concrete; also from old bound No. 87, near North Castle, to old bound No. 61, near Ridgefield.

Work of 1910. From January to June, 1910, the work of mapping the field notes was done under the direction of Mr. Henry Robinson Buck, the Commissioner for the State of Connecticut. Duplicate maps were made on sheets, 10 by 30 inches, showing prominent topographical features along and near the line, together with the location of all monuments from the "Great Stone" at Port Chester to old bound No. 23 near Kent, Connecticut.

The traverse party was organized at Wingdale, June 25, and after two weeks work on the No. 25–No.28 tangent, left unfinished from the winter previous, took up the line work at monument No. 22 near Kent, Connecticut, where it had been left off in December, 1909, by the Connecticut survey party. The work was pushed along through the woods and mountains south of Amenia Union, N. Y., across the Sharon valley and Indian pond and finally over Riga mountain, which extends along the last six miles of the line to the Massachusetts corner.

Great care was exercised in the work on running the line and very satisfactory results were obtained. The same methods and organization were adopted with which the work had been done in 1909.

On September 25, 1910, the traverse party had completed the survey of the line north and there was left only that part of the line lying in the Byram river at Port Chester, N. Y., from the "Great Stone" at the "Wading Place," or monument No. 99, to Long Island Sound, a distance of about 1½ miles.

By October 1, 1910, a system of triangulation had been laid out and the survey work on this section was well under way.

Both States were represented on the monument setting party, which was organized and began operations at Ridgefield on June 25. The work began where it was suspended in November, 1909, for lack of funds, the first monument set being at the angle point known as No. 61.

The work went on rapidly and efficiently during the summer and up to October 1, 1910. New monuments had been set at every highway crossed by the state line from No. 61, near Ridgefield, Connecticut, to No. 20, near Wassaic, N. Y., and at every angle point, except at Nos. 25, 24, 23 and 20. These points were in the hills and mountains, very difficult of access, and all the old monument stones were found to be in good condition, so they were carefully removed and replaced in a setting of concrete.

Owing to the hilly and mountainous character of the country, there were many summits between the highways, overlooking the line for long distances in either direction. Where practicable the old granite or marble stones removed from the highways were set in concrete at these intermediate controlling points. At other points drill holes were placed on line in prominent rock outcrops, or projections, and the points properly referenced for future use.

There yet remains to be done, before the work is completed, the remainder of the survey of the Byram river section at the southern end of the line and the marking or monumenting of the range points for same, the monumenting of the line from old bound No. 20 north a distance of about 20 miles and the completion of the maps from old bound No. 23 north, together with the mapping of the Byram river section. Connecticut is co-operating with us, both in the field and office work and the entire work should be completed by December 15, 1910.

Respectfully submitted,

A. T. O'LEARY,
Assistant Engineer.

New York-Massachusetts Boundary Line.

September 30, 1910.

Hon. H. W. DeGraff, *Deputy State Engineer, Albany, N. Y.:*

Sir.— I beg leave to submit herewith a report on the examination of the monuments marking the Massachusetts-New York boundary line.

The work began on the 7th day of September, 1910, and was finished on the 24th of September, 1910. In company with Mr. W. C. Hawley, representative of the State of Massachusetts, I visited every monument on the Massachusetts-New York boundary line and found all bounds located as described in the State Engineer's report of 1899.

On this line we found 112 monuments, all of which were in good condition, excepting numbers 55, 56, 65, 74, 79 and 82.

Each of the iron posts were painted with one-half pint of Devoe's white paint, thus preserving the posts and making them more visible through the woods.

During the construction of the third track by the Boston & Albany railroad, bound No. 55 was buried so that it cannot be found. This monument is not so important, since monuments Nos. 54 and 56 can both be seen from the point where monument No. 55 stood.

Monument No. 56 has been heaved by the frost, so that it now stands 5.3 feet out of the ground and leans toward the north about ten inches. This bound should be reset, as it is liable to fall over.

Monument No. 65 can be easily shaken in its foundation, as the earth about the base has been washed away. This monument, which is a B stone, stands about two feet out of the ground and leans toward the northeast about five inches.

Monuments Nos. 74, 79 and 82 are all very loose in their foundations and should be reset. Monument No. 82 also leans southwest about four inches.

Accompanying this report there is a note book containing a tabulated report of every bound.

Very truly yours,

H. J. STABILE,

Representative of the State of New York.

REPORT

OF

Coöperation of United States Geological Survey

WITH

STATE ENGINEER AND SURVEYOR

OF THE

STATE OF NEW YORK

1910

Coöperative Topographic Survey of New York.

Department of the Interior,
United States Geological Survey,
Washington.

March 21, 1911.

Hon. J. A. Bensel, *State Engineer and Surveyor, Albany, N. Y.:*

Dear Sir.— In reply to your letter of March 15:

I have the honor to make the following report of the results of the coöperative topographic survey of New York from January 1 to December 31, 1910:

Allotments.

The agreement signed by the Director of the United States Geological Survey on June 25, 1910, and by the State Engineer and Surveyor of New York on June 28, 1910, provided for the continuation of the coöperative topographic survey of the state and for the expenditure of $10,000 by each of the contracting parties during the Federal fiscal year ending June 30, 1911. Of the sum provided for coöperative surveys during the preceding fiscal year there remained on May 1, the beginning of the field season of 1910, $3,551.78, making the total sum available to June 30, 1911, $23,551.78. Of this sum there had been expended on January 1, 1911, $18,444.55, leaving a balance on the part of New York State of $1,599.66 and on the part of the United States Geological Survey of $3,507.57, a total balance of $5,107.23, to be expended for the payment of office salaries involved in the drafting of maps and for the preliminary field work of the season of 1911.

Results.

The coöperative topographic survey of New York was continued under the immediate supervisory charge of Mr. Frank Sutton, geographer in charge of the Atlantic Division, the general charge of all such work of the United States Geological Survey being under Mr. R. B. Marshall, chief geographer.

During the season of 1910 surveys were made in St. Lawrence, Delaware, Jefferson, Otsego, Chenango, Herkimer, Oneida and Lewis counties, and resulted in the completion of the Hartwick and Hammond quadrangles, the complete survey of the Canton, New Berlin and McKeever quadrangles and the partial survey of the Lowville quadrangle. Preliminary work was started on the Number Four quadrangle. The total area mapped during the season was 831 square miles, for publication on the scale of 1 : 62,500, with a contour interval of 20 feet.

For the control of the above areas, 236 miles of primary levels and 914 miles of secondary levels were run, in connection with which 48 permanent and 197 temporary bench-marks were established. In addition, 84 miles of primary traverse and 1,491 miles of secondary traverse were run, in connection with which 667 traverse stations were located and 11 were permanently marked.

Progress to Date.

Prior to the season of 1910–11 there had been surveyed and mapped 215 quadrangles and two quadrangles had been partially surveyed. At the conclusion of the field season of 1910–11, therefore, 220 atlas sheets of New York state had been completed and one partially completed, representing the topography of 40,870 square miles. The total area of the state is 49,204 square miles, thus leaving 8,334 square miles yet to be mapped.

Field Work in 1910.

Field work was commenced in May by Mr. C. E. Cooke, topographer, and Mr. J. M. Whitman, assistant topographer, and later by R. C. McKinney, topographer, Messrs. J. I. Gayetty and S. P. Floore, assistant topographers, and Mr. J. H. Lee Feaver, junior topographer, who completed the survey of the quadrangles named. Primary traverse control work was done by Mr. D. H. Baldwin, topographer, and primary leveling by Mr. C. H. Semper, assistant topographer.

Office Work.

The final drawings of the Hartwick, Hammond, Canton, New Berlin, and McKeever topographic sheets will be completed during the spring and will then be transmitted to the engraving division for publication. These, with the Antwerp, Delhi, Monticello and Neversink topographic sheets, for which advance photolithographic sheets have already been issued, are the only atlas sheets completed in New York that have not been engraved.

The Bath and Stony Creek atlas sheets were published during 1910.

Very respectfully,

H. C. RIZER,
Acting Director.

REPORT

OF

BUREAU OF HYDRAULICS

DEPARTMENT OF BARGE CANAL,

Comprising the Eleventh Annual Report on Stream Gaging

ROBERT E. HORTON,
Resident Engineer

Report on the Gaging of Streams for 1910.

Hon. Frank M. Williams, *State Engineer and Surveyor:*

Sir.— I have the honor to submit the report of the Bureau of Hydraulics, Barge Canal Department, for the calendar year 1910. This report contains the results of observations of water-levels along the lines of the Barge canal, as well as at gaging stations maintained in coöperation with the United States Geological Survey, for the purpose of determining the discharge of streams throughout the state during the year 1910.

SCOPE OF WORK DONE.

The Bureau of Hydraulics, as a specific branch of the Barge Canal Department, was organized in 1907. The work carried on by this Bureau is chiefly in the following lines:

(1) Maintenance of gaging stations in connection with the Barge canal work.

(2) Investigations and reports on special hydraulic problems arising in connection with the Barge canal work.

(3) Preparation of defense for the State in hydraulic cases, including claims for backwater, damages to water power by diversion and appropriation and other similar cases before the State Court of Claims.

DEFENSE OF CASES IN COURT OF CLAIMS.

During the year 1910, in addition to routine office work in connection with the Barge canal, the technical defense of several important claims was prepared by the Bureau of Hydraulics, the following among others:

Claim of the New England Brick Company for damage by backwater from a culvert on the Champlain canal during a flood. The technical defense included precipitation records, estimates of flow, etc., and of the capacity of the culvert in question. The case was dismissed without award.

Claim of Melville W. Van Amber and others for damages alleged to have been due to the placing of flash-boards on dam in Black river at Carthage. A survey of the portion of the river in question was made. Elaborate calculations and gagings were also made to determine the extent, if any, to which the flash-boards in question would raise the water level at the claimant's lands under the given conditions. The result of these hydraulic investigations indicated that the claimant was not materially injured by the placing of the flash-boards on the dam and that the State had not exceeded its right in connection with the matter. The claims were dismissed without award.

The claim of the Ontario Knitting Company of Oswego, N. Y., for appropriation of its mill and property, was tried in January, 1910, by the State Court of Claims. This claim involved the valuation of leases of water power rights on the Oswego Hydraulic canal, which were held by the claimant. Various other hydraulic questions entered into the matter of valuation of the property. Data were furnished by the Bureau of Hydraulics to the experts for the State, and extensive investigations and calculations were made in relation to the hydraulic features of the case. The claim was dismissed by the State Court of Claims without award.

Preparation was made for the defense by the State in the claim of Veronica Jaescke, for appropriation of a rye flouring mill and water power located on Irondequoit creek near Pittsford, N. Y. This case was partially tried out before the State Court of Claims.

Preparation was also made for defense by the State in the claim of the Oswego Falls Pulp and Paper Company for appropriation of its water rights located at the upper, or Oswego Falls dam, on Oswego river at Fulton. This claim has been tried out before State Court of Claims on question of title, but the testimony has not yet been taken on matters of valuation of the water power.

Surveys were made and technical data accumulated and reports prepared for the use of the State in its defense in connection with claims arising from the flood of February 28 and following days in 1910, at Herkimer, N. Y.

Investigations relative to and preparation of data for use by the State in defense of various other hydraulic claims were in progress at the end of the year 1910.

DEVELOPMENT OF STREAM GAGING IN NEW YORK STATE.

Preceding the year 1900 there had been comparatively little work done in connection with the gaging of streams in this state. In the original construction of the Erie canal the water supply available was usually greatly in excess of the amount required and comparatively few gagings of streams were made at that time, of which there is any record. Occasional gagings by private interests were made, which have been recorded, such for example as gagings of West Canada creek about 1820 by John B. Jervis. The earliest continuous records of the flow of a stream throughout any considerable time in this state, now on record, are those of Eaton and Madison brooks, made by Mr. Jervis as Chief Engineer of the Chenango canal in the 'forties. Systematic gagings of Croton river were begun by the city of New York in 1868 and have been continued down to date, forming an extensive and valuable series of data. Gagings of the west branch of Croton river and of small streams on Long Island were made by the city of New York at about the same time that the Croton gagings were begun. Gagings of Hemlock lake outlet were made by the city of Rochester in the 'seventies, under the direction of Mr. Emil Kuichling and Mr. Geo. W. Rafter. These engineers also obtained short gaging records on a number of small streams in central and western New York.

In 1888 systematic gagings of Hudson river at the dam of the Duncan Company at Mechanicville were instituted and have been continued down to the present time. In 1892 to 1894 gagings of several smaller streams in the vicinity of Albany and Troy were obtained by the Water Departments of those cities. In 1894 and 1895 Mr. Geo. W. Rafter undertook to establish permanent gaging stations on the upper Hudson and Genesee rivers, and these records have been continued with some interruptions down to the present time, but systematic gaging of streams for the purpose of obtaining continuous records generally throughout the state cannot be said to have been undertaken until 1898, when about 20 gaging stations were established by Geo. W. Rafter for the U. S. Board of Engineers on Deep Waterways. These stations were taken over by the U. S. Geological Survey and the State of New York in 1900 and formed a nucleus of the coöperative stream gaging work since carried on.

Stream gaging work was systematically undertaken by the State Engineer's department in 1900, and an appropriation of $1,000 was obtained by the State Engineer to be expended in coöperation with the hydrographic branch of the U. S. Geological Survey. The Geological Survey was to expend an equal or greater amount on stream gaging work in the state during the same year. The work was placed under the general supervision of the Geological Survey, subject to advice and approval of the State Engineer. The writer was appointed by the U. S. Geological Survey to take charge of the coöperative stream gaging work in New York state and the work was continued under his direction as District Hydrographer until 1906, when Mr. H. K. Barrows became District Hydrographer, continuing in that position until the spring of 1909, when Mr. C. C. Covert was made District Hydrographer.

An appropriation for stream gaging by the State Engineer's Department in coöperation with the Geological Survey has been made in each year from 1900 to 1910, excepting in the year 1905. The records were maintained during that year by the Geological Survey and were furnished to the State Engineer's Department for publication in the usual manner. The present report is the eleventh annual report of stream gaging work conducted in conjunction with the State Engineer's Department.

The necessity of having extended and reliable records of the flow of streams became very evident at the inception of the great hydraulic works undertaken in the state of New York within the past few years, notably the Barge canal construction by the State and the Ashokan reservoir water supply of the city of New York. About 100 gages were established in connection with the Barge canal work, chiefly in the years 1904 and 1905. These were mainly for the purpose of determining the water level rather than the discharge, but inasmuch as it was found that the data regarding discharge could be obtained advantageously at a considerable number of these stations, that work was also undertaken and has been carried on by the Bureau of Hydraulics in conjunction with the general supervision of the coöperative system of gaging work. Gaging stations established by the Geological Survey in coöperation with the city of New York and with the State in the Catskill region were taken over by the Board of Water Supply, chiefly in the years 1906 and 1907, and have been continued to the present time. A considerable number of gaging stations have also been established by the State Water Supply Commission in coöperation with the U. S. Geological Survey. The results of all these gagings for different portions of the state by various parties, as well as the results of gagings by private individuals, wherever available, have been included in the annual reports of the State Engineer. The object in view has been to include in the State Engineer's reports as complete a record as possible of reliable gaging data throughout the entire state.

METHODS EMPLOYED.

In the establishing of gaging stations no single method of gaging has been employed to the exclusion of others. In many instances two or more methods have been combined at a single station. The principal methods have been the use of dams as weirs in conjunction with records of the flow through turbines or other outlets at mills, and the current-meter method. Gagings by thin-edged weirs and through thin partitions or orifices have been used to some extent in the case of small streams. Surface-floats, rod-floats and surface-slope methods are also used in cases where other methods cannot be utilized.

The more important features of gaging by the principal methods used are described in the following paragraphs.

Gaging Stations at Dams and Mills.— In determining the discharge at dams and mills the method of procedure is as follows: A profile of the crest of the dam is obtained and is divided into sections, all points in a given section being nearly or precisely at the same elevation. The discharge over each section is computed for a series of crest-depths, ranging from zero to the extreme high-water mark. The summation of these sectional discharge curves furnishes data for a rating table for the entire dam, from which the volume of flow corresponding to any gage height can be read directly. When flash-boards are placed on dams, the conditions are reduced more nearly to those of a standard thin-edged weir, and Francis' well-known formula has been used in computing the discharge. The flow over waste-weirs, auxiliary spillways and flood overflows has been calculated in a manner similar to that used for dams. The amount of flow through head-gates, sluiceways, feeder gates and similar openings has been calculated from the formula for orifices.

In estimating the discharge through turbine water-wheels the results of tests, made at the testing flume of the Holyoke Water Power Company, have been largely depended upon, the mean discharge for each day having been computed from the observed working head, width of opening of speed gates and number of hours each wheel has run. A record of these facts is kept at each of the stations where there are mills in connection with dams.

One difficulty encountered in gaging northern streams results from the accumulation of ice during the winter season. It has been found impossible to keep some dams clear of ice, and an effort is made to keep a record of the length of the clear and unobstructed portion of the dam, from which a correction in the calculated flow can be made.

The method of gaging at dams and mills and the necessary data for the calculation of discharge over weirs or through turbines may be found in the water-supply and irrigation papers of the U. S. Geological Survey, Nos. 180 and 200.[a]

Current-meter Gaging Stations.— In making gagings of streams the usual method of procedure is to divide the stream into subsections usually of 5 to 10 feet width. The velocity is usually measured at the median point of each subsection by means of the current-meter, the meter wheel usually being submerged six-tenths of the depth of the stream. The revolutions of the meter wheel are recorded for a period of 100 seconds. The time is noted by means of a stop-watch reading to one-fifth second and the period of observation is usually subdivided into two intervals of fifty seconds each. Careful soundings are taken at times when the conditions are favorable and standard cross-sections are prepared therefrom, from which the areas of the subsections can be taken out more accurately than from the individual soundings made in connection with the meter measurements. A simple multiplication of the velocity in each subsection by the cross-sectional area to which it applies gives the rate of discharge for the subsection. A summation of the quantities for the several subsections gives the total measured volume of flow. A river-height gage is established at each current-meter station, from which the stage of the stream is observed once or twice daily. Current-meter measurements of the discharge are made from time to time, as opportunity permits. After a sufficient number of discharge measurements have been made they are plotted, using the gage heights of the stream as ordinates and the measured discharges as abscissas. A mean curve is drawn through the plotted points showing the discharge rate in second-feet as a function of the gage-reading. By means of this curve the average discharge rate for each day is deduced from the record of the height of the stream kept by the gage reader.

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[a] "Weir Experiments, Coefficients and Formulas" and "Turbine Water Wheel Tests and Power Tables," by Robert E. Horton.

At some locations where discharge data are required, it is impossible to obtain a permanent rating table, owing to continued or irregular changing of the regimen of the stream by backwater from dams, ice or log obstructions, or from the growth of aquatic vegetation. At such locations the discharge is determined from such measurements as can be made with corrections of the gage heights determined from a comparison of the discharge at different times.

The principal sources of error in gaging streams by the current-meter method are due to the effect of slack or nearly slack water in any part of the cross-section, or to backwater from dams, from obstructing ice, or from tributaries entering below the gaging station, thereby causing the river stage to rise at times without a proportional increase in the discharge. In accordance with the well-known Kutter formula, the volume of flow in an open channel is a function of the slope, the area of cross-section and the wetted perimeter. When a stream is rising, the slope is usually greater at a given stage of the stream than at the same stage when falling. Northern streams, as a rule, rise rapidly and fall gradually, so that the stream is falling on the majority of days of the year. The error from the above source is small, inasmuch as the discharge varies only as the square root of the slope. The principal difficulty encountered results from the freezing over of streams in winter. The ice serves greatly to increase the wetted perimeter of the measuring section, thereby modifying the rating curve. Whenever practicable, discharge measurements during winter months are made through the ice.

Rating of Current-meters.— By courtesy of the owner, arrangements were made during 1907 to rate the current-meters used by the Department at an unused canal slip in the Albany lumber district. For the purpose of rating meters a track 120 feet long was laid alongside the canal slip. The meter to be rated is suspended from an outrigger attached to a car that runs on the track. The car is drawn at a uniform velocity along the track by means of a windlass and tackle. The car is run at various speeds covering the ordinary range of velocities occurring in rivers and canals and the time required and number of revolutions of the meter wheel during each run are recorded. From this data a rating table for the current-meter is prepared, by means of which the velocity of flow of a stream can be deduced from the observed revolutions per second of the meter wheel.

Gages.— The gages at the coöperative stations are chiefly cypress planks with galvanized staple division marks and brass figures. At the Barge canal stations the original gages were mostly ⅞-inch boards, with painted or burned division marks or figures.

At present most of the gages maintained by the Barge canal department are made in sections from enameled steel strips, subdivided decimally in 1/10-foot widths. Weight-and-chain gages have been uniformly equipped with standard chain, standard adjustable weights and standard locks. Tape-and-reel gages, U. S. Weather Bureau pattern, are also used.

Gages are read each morning and night at most stations, although in some cases readings are taken only once daily. Readings are taken as a rule only to the nearest tenth or half-tenth of a foot. In some cases, where there are two or more gages in a reach of a stream in which the slope is very slight, the mean daily elevations of the down-stream gage will on some days be higher than that shown by the up-stream gage. These differences are usually only a very few hundredths of a foot and result from various causes, including the error due to reading the gage to nearest tenth foot, change in water-level between the time of reading the two gages, change in slope due to rising or falling of the stream between the two daily readings used in compiling the mean, effect of wind, etc. Instances of this character will be observed on Hudson river above Crocker's Reef dam and on Oneida and Seneca rivers, and where the differences are small they are not the result either of errors in readings or the use of an erroneous gage datum.

Accuracy of Stream Gagings.— It has not been found practicable to secure an entirely uniform degree of accuracy in the gaging of streams at all the different stations. The methods of gaging by this Department, by the U. S. Geological Survey and by the Board of Water Supply of New York city are substantially uniform. Experience has shown that reasonably accurate results, sufficiently reliable for most purposes for which they are intended, or to which they are applied, can be obtained with a very moderate expenditure per annum at each gaging station. As a rule this expenditure, including the pay of the gage reader, field work of making current-meter measurements, surveys, etc., and the office work of reducing the records does not exceed, say, $200 to $300 per year for each gaging station.

As a rule the gaging station on a given stream is selected, first, with reference to securing reliable results, and second, with reference to securing these results at moderate cost. Unless there is some special reason why gagings at a specific point are necessary, the site or sites on a given stream which will give the best results at the lowest cost are the ones selected. No attempt has been made in the publication of the results to specify with precision the degree of accuracy attained. Furthermore, the accuracy of the results depends on the form in which they are used. As a rule the mean monthly results are considerably more accurate than the results for a single day.

The object of the gaging records is to determine the quantity of water which flows past the gaging station each day. Most important streams within the state are subject to artificial control by dams and mill ponds in a greater or less degree. No effort is made to determine what the natural regimen of the stream would be if there was no artificial control.

The object of the gaging records is to show what the actual flow of the stream is under the existing conditions.

The degree of accuracy obtainable varies greatly according to the character and condition of the stream. New York streams, as a rule, fluctuate within wide limits. The same degree of accuracy obtainable in gaging of mill canals and flumes, where the flow is substantially constant, is not to be expected, nor is it obtainable, as a rule, in gaging streams, the volume of which may be at certain times twenty or thirty fold as great as at other times.

As a rule the gaging records during summer months are more accurate than those for the winter season, when the streams are more or less frozen and obstructed by ice. At some gaging stations it is possible to obtain more accurate records at ordinary and low stages than can be obtained at flood stages of the stream, whereas at others the difficulties encountered in securing accurate records in low water are greatest and the published results are most reliable for the higher stages of the stream. As a rule sufficient data are given in connection with the description of each gaging station to enable a fair estimate of the accuracy of the results to be made, but it is not practicable within the limits of this report to give in detail all the conditions affecting the results at different stages of the stream or at different times. Those who are familiar with the difficulties encountered in obtaining a continuous daily record of the flow of a stream will realize that in any event absolute precision in gaging records is not obtainable and, furthermore, that the cost of obtaining a record of the flow of a stream within 1 or 2 per cent error will, as a rule, be greater than to obtain a daily record of the flow of the stream with a possible error of 5 or 10 per cent.

Records of Water-surface Elevation.— In the report for 1910 the mode of publication of data of stream gagings and measurements of discharge of rivers and streams in the state of New York has been changed from that heretofore used. Records of elevation of water-surface on the principal rivers, following the lines of the canals of the state, have been grouped by themselves, and instead of publishing a separate description for each station, where a record of elevation of water-surface is obtained, a description of all the gages used for this purpose on a given stream is combined under one heading. This makes the tables appear in more compact form and also facilitates comparison of elevation at adjacent stations and determination of intermediate slope or fall.

These records of water-surface elevation are of fundamental importance in connection with the Barge canal work. In view of various inquiries received relative to these gaging records, it appears proper to state that many of these stations are maintained for the purpose of securing water-surface elevations only, and no effort is being made or will be made to secure data of discharge. Many of the gages are maintained exclusively for obtaining water-surface elevations and are located at situations where it would not be practicable to secure data of discharge, if it was so desired. In this connection it may be stated that at the time most of these water-surface gages were established final precise levels connecting the elevation of the datum of each gage were not available at all stations. The records heretofore published have been referred to tide water elevation as nearly as determined, and occasionally corrections and republication have been necessary, as more accurate elevations have been obtained.

ACKNOWLEDGMENT.

In connection with the gaging stations it is necessary to employ as observers person living near the sites selected for the gages. The observers are necessarily as a rule persons who have had no previous experience in similar work. They are required in most instances to read their gages each morning and night every day in the year, but as the average pay of an observer is but a few dollars per month, it is necessary that he should be otherwise employed during the working hours of the day. As a check on the work of the observer, inspection trips are made at frequent intervals by hydrographers from this office, by whom independent gage readings are taken. Close agreement found in most cases between the observer's readings and those of the inspector, taken without the knowledge of the observer, testifies to the intelligent and careful work of the observer.

Acknowledgment should be made to Mr. J. Waldo Smith, Chief Engineer, Board of Water Supply of the City of New York, for records furnished and for permission to publish them in this report. Acknowledgement is also made to various corporations and individuals who have furnished gaging data or coöperated in the work. Specific credit for results furnished in each case is given in connection with the data in the following pages.

Computations of discharge at stations maintained by the U. S. Geological Survey in coöperation with this Department, also in coöperation with the State Water Supply Commission, have been made by Mr. C. C. Covert. Computations of discharge at gaging stations maintained by this Department have been made under the writer's direction by Mr. J. P. Newton, Assistant Engineer. Credit is also due to the other employees of the Department for faithful and efficient work in field and office.

ST. LAWRENCE RIVER DRAINAGE.

GENERAL FEATURES.

St. Lawrence river receives the flow of a number of New York streams having their sources in a northerly slope of the Adirondacks and fed by the numerous lakes with which the region is dotted. Some of these rivers, as the Grass, Raquette and St. Regis, lie entirely within the United States; others, notably Salmon, Trout, Chateaugay and English rivers, cross the international boundary and flow northward into the St. Lawrence in Canada, as does also Richelieu river, the outlet of Lake Champlain. The following table gives a list of the principal tributaries of the St. Lawrence in the United States, with the areas drained by them, determined chiefly from Bien's Atlas of the State of New York.

Drainage Areas of St. Lawrence River Tributaries in the United States.

	Square miles.		Square miles
Oswegatchie river	1,609	Salmon river *a*	273
Grass river	637	Trout river *b*	129
Raquette river	1,219	Chateaugay river *b*	199
St. Regis river	910	English river *b*	53
Little Salmon river *a*	103	Lake Champlain *c*	7,867

a Above junction near international boundary. *b* At New York state line. *c* Above outlet.

The St. Lawrence drains, through Lake Champlain, an area of 4,560 square miles in the State of Vermont. This drainage is practically all from Missisquoi, Lamoille and Winooski rivers and Otter creek.

LAKE CHAMPLAIN DRAINAGE BASIN.

DESCRIPTION OF BASIN.

Lake Champlain occupies a long and narrow valley, extending in a north-south direction and forming a part of the boundary between New York and Vermont. The elevation of the lake is about ninety-five feet above tide and the water-surface area is 436 square miles.

The drainage basin is irregular in form, being about seventy-five miles wide from a point opposite Middlebury, Vt., northward to the outlet of the lake at Rouses Point, on the international boundary. South of Middlebury the average width of the basin is about thirty-five miles and the lake itself is very narrow, forming virtually a drowned river.

The tributary region is rugged and mountainous, mostly covered with forest and with little depth of soil except in the stream valleys. The drainage is received almost entirely through large tributaries, there being little direct coast drainage into the lake. The outlet of the lake is Richelieu river, which flows northward in Canada from Rouses Point to St. Lawrence river.

In estimating the run-off from this basin in previous years the drainage area has been taken as 7,750 square miles. Maps have recently become available from which the area of the lake and its tributary drainage basin have been more accurately determined, as shown in the following table.*

Drainage Areas Tributary to Lake Champlain.

LOCALITY.	AREA IN SQUARE MILES.		
	Place to place.	Sub-total.	Total.
Pike river and adjacent area in Canada		*a*242.0	
Missisquoi river in Canada		*b*245.0	
Land area in Canada above outlet			487.0
Missisquoi river in Vermont		*b*615.0	
(Total Missisquoi river, 860 square miles.)			
Lamoille river		*b*725.0	
Winooski river		*b*995.0	
Otter creek		*b*935.0	
Eastern coast drainage		*b*534.4	
Mettawee, Poultney and Castleton rivers in Vermont		*c*376.0	
Land area in Vermont, except islands			4,180.4
Wood creek above Smiths Basin	18.6		
Big creek above junction with Wood creek	35.16	53.76	
Wood creek, Smiths Basin to Fort Ann	9.9	63.66	
Halfway creek above Kane's falls	78.82		
Halfway creek, Kane's falls to junction with Wood creek at Fort Ann	6.69	85.51	
Wood creek at Fort Ann, including Halfway creek		149.17	
Wood creek, Fort Ann to junction with Mettawee	55.73	204.90	
Mettawee river in Vermont	151.9		
Mettawee river in New York	55.7		
Total, Mettawee river		207.6	
Total, Wood creek and Mettawee river at junction		412.5	
Wood creek, junction Mettawee river to Whitehall	13.65	426.15	
Wood creek, Whitehall to junction with Poultney river	1.65	427.8	
Castleton river, in Vermont	100.9		
Poultney river, including Castleton river in Vermont		254.8	
Poultney river in New York		11.0	
Poultney river, total to junction with Wood creek		265.8	
Total, Wood creek and Poultney river at junction			693.6
Wood creek, Mettawee and Poultney rivers in New York			286.9
Lake George outlet		220.1	
Bouquet river		*c*268.1	
Ausable river		*d*521.3	
Little Ausable river		*d*75.1	
Saranac river		*d*629.6	
Little Chazy river		*c*63.8	
Big Chazy river		*d*299.4	

a From maps of Canadian Geological Survey. Scale: 4 miles = 1 inch.
b United States post-route maps. Scale: 12.5 miles = 1 inch.
c Topographic maps of U. S. G. S. Scale: 1 mile = 1 inch (nearly).
d Bien's Atlas of New York. Scale: 2.5 miles = 1 inch.

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* Table here presented is a revision of that appearing in the 1907 report.

Lake Champlain Drainage — (Continued).

LOCALITY.	AREA IN SQUARE MILES.		
	Place to place.	Sub-total.	Total.
Western coast drainage		[d]344.6	
Land area in New York, except islands			2,708
Islands in New York		[e]55.2	
Total land area above outlet			7,431.5
Water-surface in Canada		[e]16.5	
Water-surface in United States		[e]419.1	
Total water-surface		435.6	
Total drainage area above outlet			7,867.1
Richelieu river, Rouses Point to Chambly	[a]310.0		
Total drainage area above Chambly			8,177.1
Richelieu river, Chambly to mouth	[a]626.3		
Richelieu river, total		936.3	
Total drainage area above mouth			8,803.4

[a] From maps of Canadian Geological Survey. Scale: 4 miles = 1 inch.
[d] Bien's Atlas of New York. Scale: 2.5 miles = 1 inch.
[e] Charts of U. S. Coast and Geodetic Survey. Scale: 1:40,000.

RICHELIEU RIVER AT FORT MONTGOMERY, ROUSES POINT, N. Y.

A record of the height of Lake Champlain at Rouses Point, at the head of Richelieu river, the outlet of the lake, has been kept at Fort Montgomery, by the United States Corps of Engineers, beginning in 1875. Through the courtesy of Capt. Harry Taylor, the gage readings taken by William McComb, the fort keeper, at 9 A. M. each day, are reported weekly to the United States Geological Survey.

The depth of the water is taken on a reference mark on the base of the scarp wall, at the north face of bastian B, about three feet from the angle with the east curtain of Fort Montgomery. This reference point is 1.50 feet above an assumed zero, and 1.50 is added to the measured depth to determine the gage reading. In winter the depth as the water rises in a hole in the ice is commonly taken. On windy days the stage is taken in a well within the fort inclosure by measuring the depth on a flagstone in the bottom of the well.

Elevations at Fort Montgomery.

	Feet above tide.
Elevation of reference point on scarp wall of Fort Montgomery [a]	94.998
Elevation of gage zero	93.501
Assumed high water, Lake Champlain	102.611
Assumed low water, Lake Champlain	93.361

[a] United States Deep Waterways report, part 1, p. 429.

The range of rise and fall of the lake is thus seen to be 9.25 feet, representing an available storage volume of about six inches on the entire catchment area above the outlet.

The land drainage area above Rouses Point is 7,432 square miles. The water-surface of the lake is 436 square miles, making the total area at the foot of the lake 7,867 square miles.

The daily discharge of the lake has been determined from observations of the depth and discharge over the Chambly dam, thirty-five miles below the head of Richelieu river, made in 1898 by the United States Board on Deep Waterways. A rating table has been derived from the observations at the Chambly dam and the gage readings taken at Rouses Point. The area tributary to the river between Rouses Point and Chambly is 310 square miles, making the total drainage basin above Chambly, 8,177 square miles. The publication of discharge estimates at this station for the years 1907–1910 has been withheld pending the acquisition of additional data to check and if necessary revise the rating table heretofore used.

Mean Daily Gage Height, in Feet, of Richelieu River at Fort Montgomery, Rouses Point, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	93.00	93.95	94.60	97.80	96.70	96.10	95.55	94.30	93.70	93.80	93.70	93.75
2......	92.95	94.00	94.90	97.85	96.80	96.15	95.50	94.25	93.70	93.40	93.90	93.80
3......	92.95	94.00	95.25	97.85	96.60	96.10	95.45	94.30	93.95	93.50	93.50	93.80
4......	92.90	94.05	95.45	97.95	96.65	96.00	95.35	94.35	93.65	93.95	93.40	93.80
5......	92.95	94.00	95.65	97.85	96.90	96.00	95.40	94.25	93.70	93.60	93.60	93.70
6......	92.95	94.00	95.85	97.85	96.95	96.05	95.35	94.25	93.75	93.75	93.70	93.75
7......	92.90	94.10	96.15	97.75	97.00	96.05	95.35	94.20	93.75	93.50	93.80	93.75
8......	92.95	94.15	96.40	97.70	96.90	96.10	95.25	94.20	93.80	93.60	93.75	93.80
9......	92.95	94.15	96.60	97.75	96.90	96.25	95.20	94.25	93.80	93.70	93.80	93.70
10......	92.90	94.10	96.75	97.70	96.85	96.30	95.15	94.40	93.75	93.55	93.80	93.70
11......	92.90	94.05	96.85	97.70	96.80	96.30	95.10	94.20	93.80	93.60	93.85	93.70
12......	92.55	94.05	97.00	97.65	96.75	96.35	95.05	94.20	93.85	93.35	93.80	93.60
13......	92.90	94.00	......	97.65	96.70	96.30	95.05	94.20	93.65	93.50	93.85	93.60
14......	92.90	94.00	......	97.65	96.60	96.25	95.00	94.15	93.65	93.50	93.80	93.70
15......	92.90	94.05	......	97.50	96.55	96.25	94.90	94.15	93.75	93.50	93.80	93.55
16......	92.95	94.05	......	97.45	96.55	96.15	94.80	94.10	93.70	93.40	93.75	93.60
17......	92.95	94.05	97.00	97.75	96.50	96.20	94.75	94.15	93.65	93.50	93.75	93.70
18......	92.95	94.00	96.95	97.45	96.60	96.15	94.65	94.25	93.65	93.55	93.80	93.60
19......	92.90	94.10	......	97.30	96.30	96.10	94.65	94.00	93.60	93.60	93.75	93.65
20......	92.90	94.05	......	97.30	96.20	96.05	94.60	94.00	93.65	93.50	93.80	93.65
21......	92.95	94.10	......	97.20	96.20	96.05	94.80	94.05	93.60	93.40	93.85	93.55
22......	93.00	94.15	......	97.15	96.15	96.00	94.75	94.10	93.55	93.90	93.75	93.60
23......	93.30	94.20	......	97.10	96.20	95.90	94.55	94.10	93.65	93.40	93.80	93.75
24......	93.50	94.20	......	97.05	96.20	95.85	94.55	94.10	93.95	93.40	93.90	93.60
25......	93.65	94.20	97.05	97.00	96.10	95.85	94.55	94.10	93.75	93.45	93.75	93.55
26......	93.75	94.25	97.20	97.00	96.10	95.80	94.45	93.95	93.65	93.40	93.70	93.65
27......	93.85	94.25	97.40	96.90	96.10	95.80	94.45	93.95	93.55	94.00	93.65	93.70
28......	93.85	94.35	97.80	97.65	96.15	95.70	94.40	93.95	93.60	93.45	93.70	93.70
29......	93.85	......	97.65	96.80	96.15	95.65	94.40	93.75	93.55	93.50	93.75	93.65
30......	94.00	......	97.70	97.10	96.15	95.60	94.45	93.75	93.75	93.55	93.70	93.75
31......	93.95	......	......	......	96.10	......	94.30	94.00	......	93.70	......	93.80

SARANAC RIVER.

DESCRIPTION.

Saranac river rises in southeastern Franklin county, and flows northeastward to a point near Cadyville and thence eastward into Lake Champlain at Plattsburg. The southern boundary of the basin is the Ampersand mountain range, and the stream drains the north slope of the most elevated region of the State of New York. About 16.2 per cent of the upper drainage area is water-surface. The areas tributary to the river are shown in the following table:

Drainage Areas of Saranac River. a

LOCATION.	Area.	Total area.
	Square miles.	*Square miles.*
Above Saranac lake State dam	....	157.5
Above Saranac Lake village	44.9	202.4
Above Franklin Falls	104.3	306.7
North Branch Saranac river	136.6	136.6
At junction North branch	....	498.8
Above High Falls	19.6	518.4
Above Cadyville	74.6	593 0
Above Kent Falls	2.9	595.9
Above Morrisonville	2.0	597.9
Above Lozier dam	26 1	624.0
Above mouth	5.6	629.6

a From Bien's Atlas of New York.

The results of gagings of Saranac river at a station formerly maintained at Saranac lake are given in the report of the State Engineer and Surveyor for 1903, supplement, pages 71–74.

In 1854 a timber dam was built below lower Saranac lake for the purpose of flooding logs. In 1899–1901 a masonry dam and lock were erected by the State at this point.

SARANAC RIVER NEAR PLATTSBURG, N. Y.

A gaging station was established by Robert E. Horton at the dam of the Plattsburg Light, Heat and Power Company, six miles above Plattsburg, March 17, 1903. This station is maintained by the U. S. Geological Survey in coöperation with this Department.

The record includes the flow over a straight spillway crest 171.25 feet in length, the discharge through two five-foot waste gates when open, and the discharge through five thirty-three-inch Victor turbines controlled by automatic governors. The gages were read and the record furnished by A. E. Hare until January, 1907; since then the record has been furnished by the company. Experiments were made at Cornell University hydraulic laboratory on a model of the ogee section of the dam, from which coefficients have been derived for the calculation of the discharge.[a]

Current-meter measurements have been made in the tail-race to calibrate the turbines.

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[a] Horton. "Weir experiments, coefficients and formulas."

Mean Daily Discharge, Second-feet, of Saranac River at Plattsburg, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	308	351	816	1,990	720	766	300	280	227	273	391	426
2	396	423	931	1,830	712	643	300	178	272	259	537	384
3	528	471	1,180	1,740	1,250	557	355	195	232	397	410	328
4	404	368	953	1,600	2,160	629	382	245	249	358	427	231
5	243	370	1,400	1,490	1,440	612	417	179	272	320	504	343
6	318	309	1,560	1,470	1,130	758	242	225	395	382	459	305
7	256	240	1,920	1,350	1,100	1,160	320	212	562	471	447	271
8	326	446	1,660	1,380	1,080	1,240	189	366	442	475	340	254
9	275	305	1,370	1,400	1,030	937	377	426	264	571	487	310
10	344	374	1,300	1,340	1,140	779	147	212	306	339	511	275
11	280	360	1,290	1,170	993	767	306	310	272	402	437	248
12	263	360	1,200	1,030	915	909	301	357	280	388	441	366
13	472	288	1,350	1,090	795	862	281	401	294	365	347	235
14	330	322	1,180	1,020	742	671	211	153	311	396	428	296
15	453	283	947	998	686	617	211	329	288	409	423	331
16	270	333	825	989	726	625	208	369	300	282	437	311
17	388	359	705	978	588	600	192	232	353	434	385	335
18	291	390	643	949	686	651	263	234	235	367	377	375
19	358	375	657	1,360	658	631	232	355	286	365	425	423
20	270	357	886	1,490	664	626	352	371	244	330	333	411
21	377	444	1,190	1,240	724	581	354	352	292	330	386	380
22	502	288	1,400	1,070	858	542	196	314	314	392	377	358
23	534	399	1,840	971	754	542	244	388	324	368	385	386
24	524	385	1,720	953	686	438	183	470	325	387	355	340
25	396	347	2,680	728	790	282	226	284	306	412	379	101
26	364	340	2,740	739	1,020	245	243	293	275	523	296	394
27	355	407	2,340	693	818	361	211	323	313	491	260	578
28	342	563	2,060	725	709	320	222	318	281	556	468	368
29	394	......	2,300	654	714	427	202	312	321	525	503	388
30	305	......	2,350	668	810	240	260	209	414	473	433	343
31	341	......	2,100	......	786	......	165	287	......	426	......	375
Mean	362	366	1,470	1,170	900	634	261	296	308	402	413	338

Monthly Discharge of Saranac River at Plattsburg, N. Y.

[Drainage area, 624 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
January	534	243	362	0.580	0.67
February	563	240	366	0.587	0.61
March	2,740	643	1,470	2.36	2.72
April	1,990	654	1,170	1.88	2.10
May	2,160	588	900	1.44	1.66
June	1,240	240	634	1.02	1.14
July	417	147	261	0.418	0.48
August	470	153	296	0.474	0.55
September	562	227	308	0.494	0.55
October	571	250	402	0.644	0.74
November	537	260	413	0.662	0.74
December	578	101	338	0.542	0.62
The year	2,740	101	577	0.925	12.58

WOOD CREEK DRAINAGE BASIN.

DESCRIPTION.

Wood creek flowed originally along a tortuous course in a flat valley skirted by bold slopes, the general course being northerly from a point five miles east of Hudson river at Fort Edward. From Smiths Basin northerly, it is alternately paralleled by and canalized to form Champlain canal, so that the flow of this portion of the stream is artificially controlled.

Half Way creek, the principal tributary of Wood creek, from the west, enters at Fort Ann. This stream receives the drainage from Putnam mountain and an adjacent group of small lakes. A fall of sixty feet occurs at Kanes Falls. Wood creek is joined by Mettawee river a short distance above Whitehall. The drainage from Poultney and Castleton rivers enters the arm of Lake Champlain through which Wood creek flows below Whitehall.

WOOD CREEK BELOW DAM AT WHITEHALL, N. Y.

A gage has been maintained by this Department below the dam at Whitehall since January 22, 1905. This gage gives a record of the fluctuation in level of water in the arm of Lake Champlain into which Wood creek discharges.

The original gage, erected by Mr. D. B. LaDu, was attached to the face of the Champlain Silk Mill on the right-hand side of the stream below the dam. A new gage attached to the face of the timber docking below the dam on the left-hand side of the stream is now used. The zero mark of each gage is at elevation 73.0, Barge canal datum.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Wood Creek (a) below Dam a Whitehall, N. Y.

DAY.	Jan.*b*	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	......	*b*	*c*	*c*	97.95	97.45	96.95	95.95	95.05	94.65	94.65	95.45
2......	......	*b*	*c*	*c*	97.90	97.45	96.85	95.85	94.95	94.25	95.20	95.35
3......	......	*b*	*c*	*c*	97.70	97.40	96.95	95.75	95.10	94.05	95.70	95.15
4......	......	*b*	*c*	*c*	97.95	97.50	96.90	95.65	95.15	93.95	95.95	95.15
5......	......	*b*	98.65	98.85	98.10	97.35	96.85	95.65	95.20	94.05	95.65	95.20
6......	......	*b*	98.70	*c*	98.15	97.10	96.75	95.55	95.25	94.25	95.55	95.10
7......	......	*b*	98.90	*c*	98.15	97.55	96.70	95.55	95.15	94.50	95.50	95.15
8......	......	*b*	*c*	*c*	98.35	97.85	96.65	95.60	95.20	94.00	95.65	95.05
9......	......	*b*	98.75	*c*	98.05	97.75	96.55	95.65	95.05	95.20	95.50	95.05
10......	......	94.20	98.75	*c*	98.00	97.25	96.55	95.60	94.95	95.45	95.45	95.05
11......	......	94.35	98.35	*c*	97.70	97.35	96.30	95.50	94.75	95.30	95.35	95.05
12......	......	94.55	98.40	*c*	97.50	97.40	96.35	95.45	94.85	95.15	95.35	95.15
13......	......	94.65	98.45	98.75	97.35	97.10	96.40	95.35	95.15	95.05	95.25	95.05
14......	......	94.30	98.55	98.65	97.05	96.95	96.35	95.35	95.45	95.00	95.05	95.05
15......	......	94.40	98.25	*c*	97.35	97.10	96.25	95.40	95.50	94.90	95.00	95.15
16......	......	94.45	98.20	98.70	97.25	97.05	96.35	95.40	95.20	94.90	95.05	95.05
17......	......	94.40	98.35	98.75	97.00	97.10	96.55	95.50	94.90	94.80	95.15	94.95
18......	......	95.45	98.15	98.40	97.05	97.35	96.50	95.40	94.85	94.60	95.05	95.00
19......	......	94.35	97.95	98.25	97.25	97.35	96.45	95.35	94.85	94.55	95.15	95.05
20......	......	94.40	97.85	98.05	97.05	97.05	96.35	95.30	94.95	94.15	95.05	95.05
21......	......	94.45	97.80	97.85	97.35	97.00	96.20	95.30	95.05	93.80	94.95	94.95
22......	......	95.00	98.05	98.10	97.65	96.90	96.05	95.15	94.75	93.95	95.15	95.10
23......	......	95.35	98.45	97.70	97.30	97.00	95.95	95.05	94.55	93.95	95.25	95.15
24......	......	95.20	98.10	98.00	97.25	97.05	95.95	95.00	94.50	94.25	95.35	95.25
25......	......	95.10	98.50	98.05	97.60	97.30	95.85	94.95	94.45	94.55	95.45	95.40
26......	......	95.00	*c*	97.75	97.95	96.95	95.90	94.80	94.85	94.35	95.60	95.35
27......	......	97.45	*c*	97.65	97.50	96.85	96.00	94.75	95.60	94.65	95.55	95.35
28......	......	*c*	98.45	97.40	97.55	96.95	96.05	94.95	95.85	95.05	95.55	95.40
29......	......	......	*c*	97.45	97.40	96.90	96.00	95.30	95.60	95.20	95.45	95.55
30......	......	......	*c*	97.30	97.30	97.00	96.10	95.25	95.25	94.95	95.55	95.50
31......	......	......	*c*	......	97.45	......	96.10	94.95	......	94.60	......	95.65

a Arm of Lake Champlain. *b* No record. *c* Above gage; no record.

WOOD CREEK ABOVE DAM AT WHITEHALL, N. Y.

A record of the stage of Wood creek has been kept since September 19, 1904, when a gage was established above the stone dam of the Champlain Silk Mill by D. B. La Du, of this Department. The old dam was removed and a new dam was constructed in connection with the Barge canal work during 1910. For a portion of this season the flow of the stream has been diverted through a by-pass channel and no record of its stage was kept. Subsequent to the completion of the dam a portion of the flow has been diverted through the turbines of the Champlain Silk Mill.

The conditions have been such that no attempt has been made to calculate the discharge of the stream at this point.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Wood Creek above Dam (d) at Whitehall, N. Y.

DAY.	Feb.	Mar.	April.	May.	June.	July.*c*	Aug.*d*	Sept.	Oct.	Nov.
1910.										
1	*a*	*b*	109.60	108.85	110.00	......	*c*	103.00	104.35	103.95
2	*a*	*b*	109.45	108.50	109.65	......	*c*	102.95	104.05	......
3	*a*	*b*	109.40	108.55	109.10	......	*c*	102.95	103.80	......
4	*a*	*b*	108.85	109.10	109.00	......	*c*	102.95	103.50	......
5	*a*	112.00	108.75	109.10	109.40	......	*c*	102.90	103.30	......
6	*a*	112.20	108.90	108.90	110.00	......	*c*	103.05	103.25	......
7	*a*	112.20	109.25	108.95	110.70	......	*c*	103.55	103.05	......
8	*a*	*b*	109.25	109.05	110.65	......	*c*	103.45	103.15	......
9	*a*	111.90	109.30	108.90	110.20	......	*c*	103.10	103.10	......
10	107.80	110.95	109.15	108.65	109.30	......	*c*	102.85	103.20	......
11	107.85	110.60	108.80	108.40	109.55	......	*c*	102.60	103.10	......
12	107.95	110.40	109.15	108.15	110.05	......	*c*	102.50	103.15	......
13	108.05	110.55	109.05	107.70	109.75	......	*c*	102.85	103.15	......
14	107.85	110.65	108.80	107.50	109.05	......	*c*	103.25	103.05	......
15	107.80	110.20	108.55	108.05	108.65	......	*c*	103.70	103.00	......
16	107.85	109.85	108.10	108.20	108.65	......	*c*	103.25	102.95	......
17	107.75	109.85	108.35	108.10	108.85	......	*c*	102.95	102.80	......
18	107.90	109.85	108.60	107.90	108.05	......	*c*	102.75	102.95	......
19	107.75	109.55	109.55	108.45	107.90	......	*c*	102.45	102.85	......
20	107.90	110.15	109.25	108.35	108.05	......	*c*	102.45	102.85	......
21	107.80	110.50	108.95	108.30	107.75	......	*c*	102.35	102.70	......
22	108.30	110.55	108.60	108.20	107.65	......	*c*	102.35	102.85	......
23	108.75	110.55	108.45	108.10	107.60	......	*c*	102.50	102.95	......
24	108.70	110.50	108.45	108.25	107.65	......	*c*	102.60	103.10	......
25	108.75	111.20	108.35	108.45	107.65	......	*c*	102.65	103.50	......
26	108.65	111.35	108.80	110.55	*c*	......	*c*	103.55	103.65	......
27	110.55	110.80	109.35	109.70	*c*	......	*c*	*b*	103.85	......
28	*b*	110.15	108.60	109.15	*c*	......	102.75	*b*	104.10	......
29	......	109.90	108.30	109.25	*c*	......	102.85	104.55	104.15	......
30	......	109.85	108.65	109.45	*c*	......	102.95	104.35	104.10	......
31	......	109.75	......	109.95	......	......	102.95	......	103.95	......

a No record. *b* Above gage; no record. *c* Dam removed. *d* After Aug. 28 readings taken in artificial channel.

RAQUETTE RIVER.

DESCRIPTION.

Raquette river drains a long, narrow basin extending from northern Hamilton county to St. Lawrence river. Its sources are on an elevated plateau, dotted with mountains interspersed with lakes. The region is timbered, but numerous marsh and swamp areas exist, many of which are on the divide and feed streams flowing in opposite directions. The lakes of the head waters afford ample opportunities for storage development.

RAQUETTE RIVER AT MASSENA SPRINGS, N. Y.

A gaging station was established by Robert E. Horton at the highway bridge at Massena Springs, September 21, 1903. Observations were continued until October 17, 1903, when the station was temporarily abandoned. It was resumed April 9, 1904, and has since been maintained by the U. S. Geological Survey in coöperation with this Department.

The channel is straight for 300 feet above and 1,000 feet below the bridge, which consists of a single span of 167.5 feet. The banks are not subject to overflow. The current is swift and uniform.

Discharge measurements are made from the down-stream side of the Massena Springs highway bridge. The initial point for soundings is the top of the right bridge abutment on the up-stream side of the bridge.

The gage, which was read during 1910 by F. L. Babcock, consists of a vertical scale attached to the right abutment on the up-stream side of the bridge. The bench-mark is a cross painted on the outside down-stream corner of the foundation adjacent to the sulphur springs; elevation above gage datum, 12.21 feet. The Sunday flow of this stream, like many others in this State, is often held back during the low-water season, while ponds at mills above are being refilled. Where there is extensive pondage of this character, the resultant effect may be shown in the stream for several days.

Mean Daily Gage Height, in Feet, of Raquette River at Massena Springs, N. Y.

DAY.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1910.									
1	......	6.95	4.70	4.65	3.35	2.05	1.65	1.85	2.50
2	......	7.10	4.70	4.65	3.20	2.00	1.62	2.15	2.15
3	......	7.20	4.75	4.50	3.10	2.10	1.75	1.50	2.75
4	......	7.15	5.05	4.35	2.30	1.90	1.25	2.15	2.85
5	......	7.05	5.95	4.10	3.35	1.75	1.70	1.95	2.95
6	......	7.15	6.00	4.40	2.85	1.65	2.20	2.10	2.85
7	......	7.05	5.65	4.25	2.20	1.85	2.15	1.90	3.05
8	......	6.95	5.50	4.80	1.85	2.00	2.30	2.70	2.95
9	......	7.00	5.65	5.00	1.75	2.80	2.45	3.35	2.40
10	......	6.85	5.65	4.85	2.35	2.45	2.65	3.00	2.65
11	......	6.95	5.55	4.75	2.05	1.70	2.50	2.80	3.20
12	7.60	6.95	5.65	4.75	2.25	1.60	2.20	2.35	3.05
13	7.70	7.05	5.65	4.90	2.20	1.65	2.35	2.20	3.10
14	7.80	6.95	5.70	4.50	1.70	1.55	2.35	3.15	3.35
15	7.50	6.95	5.25	4.45	1.88	1.75	2.15	2.55	3.40
16	7.45	6.55	5.25	4.60	2.15	1.75	2.35	2.30	2.95
17	7.25	6.20	5.35	4.35	2.05	1.80	2.55	2.00	3.15
18	6.90	6.30	5.25	4.35	1.75	1.65	2.10	2.50	3.25
19	6.65	6.25	5.10	4.45	2.12	1.65	2.15	2.40	3.05
20	7.15	6.35	4.85	4.70	2.15	1.40	2.25	1.95	2.85
21	6.95	6.25	4.70	4.15	2.15	1.25	2.05	1.80	2.80
22	6.90	5.80	4.90	4.15	1.65	1.45	1.60	2.00	3.25
23	6.60	5.60	4.95	4.05	1.90	1.85	1.40	2.25	2.55
24	6.10	5.25	4.65	3.90	1.80	2.05	1.60	2.15	2.35
25	6.30	5.50	4.65	3.72	1.60	1.90	1.65	2.40	2.85
26	6.55	5.40	4.75	3.60	2.20	1.70	1.65	2.45	3.05
27	6.75	5.25	4.75	3.30	2.25	1.70	2.05	2.75	2.80
28	6.80	5.15	4.75	3.30	1.70	1.55	2.30	3.05	2.75
29	6.40	5.05	4.65	3.05	1.60	1.55	1.60	3.30	2.95
30	6.45	4.90	4.50	3.08	1.75	2.00	1.75	3.10	1.65
31	6.60	......	4.35	......	2.15	1.40	......	3.00	......

Note.—River frozen over during January, February, part of March and December.

Current-meter Discharge Measurements of Raquette River at Massena Springs, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
1910.		*Feet.*	*Feet.*	*Square feet.*	*Ft. per second.*	*Second-feet.*
Mar. 30......	C. C. Covert..................	6.38	173	1,110	4.22	4,680
Aug. 23......	W. G. Hoyt....................	1.90	166	341	1.75	597

Mean Daily Discharge, Second-feet, of Raquette River at Massena Springs, N. Y.

DAY.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1910.									
1..........................	1,050	5,210	2,790	2,740	1,590	675	457	559	955
2..........................	1,050	5,400	2,790	2,740	1,470	645	443	735	735
3..........................	1,050	5,520	2,840	2,600	1,390	705	506	388	1,120
4..........................	1,050	5,460	3,120	2,460	825	586	284	735	1,200
5..........................	1,050	5,330	4,060	2,240	1,590	506	481	616	1,270
6..........................	1,050	5,460	4,110	2,500	1,200	457	765	705	1,200
7..........................	1,480	5,330	3,730	2,370	765	559	735	586	1,350
8..........................	2,200	5,210	3,580	2,880	559	645	825	1,090	1,270
9..........................	3,000	5,270	3,730	3,080	506	1,160	922	1,590	890
10..........................	3,500	5,090	3,730	2,930	858	922	1,060	1,310	1,060
11..........................	5,000	5,210	3,630	2,840	675	481	955	1,160	1,470
12..........................	6,040	5,210	3,730	2,840	795	433	765	858	1,350
13..........................	6,180	5,330	3,730	2,980	765	457	858	765	1,390
14..........................	6,310	5,210	3,780	2,600	481	410	858	1,440	1,590
15..........................	5,900	5,210	3,320	2,550	575	506	735	988	1,630
16..........................	5,840	4,730	3,320	2,700	735	506	858	825	1,270
17..........................	5,580	4,330	3,420	2,460	675	532	988	645	1,430
18..........................	5,150	4,440	3,320	2,460	506	457	705	955	1,510
19..........................	4,850	4,390	3,180	2,550	717	457	735	890	1,350
20..........................	5,460	4,500	2,930	2,790	735	345	795	616	1,200
21..........................	5,210	4,390	2,790	2,280	735	284	675	532	1,160
22..........................	5,150	3,890	2,980	2,280	457	366	433	643	1,510
23..........................	4,790	3,680	3,030	2,190	586	559	345	795	988
24..........................	4,220	3,320	2,740	2,060	532	675	433	735	858
25..........................	4,440	3,580	2,740	1,900	433	586	457	890	1,200
26..........................	4,730	3,480	2,840	1,800	765	481	457	922	1,350
27..........................	4,970	3,320	2,840	1,550	795	481	675	1,120	1,160
28..........................	5,030	3,220	2,840	1,550	481	410	825	1,350	1,120
29..........................	4,560	3,120	2,740	1,350	433	410	433	1,550	1,270
30..........................	4,620	2,980	2,600	1,370	506	645	506	1,390	457
31..........................	4,790	......	2,460	......	735	345	......	1,310	......
Mean....................	4,040	4,560	3,210	2,390	770	538	666	926	1,210

Monthly Discharge of Raquette River at Massena Springs, N. Y.
[Drainage area, 1,170 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
January..........................	631	....	(690)	(.590)	(.68)
February..........................	....	....	(960)	(.820)	(.85)
March..........................	(6,310)	(1,050)	(4,040)	(3.45)	(3.98)
April..........................	5,520	2,980	4,560	3.90	4.35
May..........................	4,110	2,460	3,210	2.74	3.16
June..........................	3,080	1,350	2,390	2.04	2.28
July..........................	1,590	433	770	0.658	0.76
August..........................	1,160	284	538	0.460	0.53
September..........................	1,060	284	666	0.569	0.63
October..........................	1,590	388	926	0.791	0.91
November..........................	1,630	457	1,210	1.03	1.15

NOTE.— The above estimates for winter periods are provisional and subject to revision for purpose of publication in the Federal report for 1910.

RAQUETTE RIVER AT PIERCEFIELD, N. Y.

A gaging station was established August 20, 1908, by the U. S. Geological Survey in coöperation with the State Water Supply Commission at a point about one-half mile down-stream from the dam of the International Paper Company at Piercefield. The gaging station is located at the head of Black rapids. There the stream is confined to a single channel at all stages and there is sufficient current to afford good opportunity for measurements in ordinary and high stages, but the stream becomes sluggish in low water. Current-meter measurements are made from a boat held in position by a wire stretched across the stream at ordinary and low stages. During high water the measurements are made at the highway bridge crossing the pond a short distance above the dam of the Paper Company. The stream was little obstructed by ice at the gaging station and the rating curve deduced for open water conditions is utilized in calculating discharge throughout the entire year. The observer is W. B. Graves. The records here published have been compiled from the reports of the New York State Water Supply Commission.

Current-meter Discharge Measurements of Raquette River at Piercefield, N. Y.

DATE.	Hydrographer.	Mean gage reading.	Total area.	Total width.	Corrected discharge.
			Square feet.	*Feet.*	*Second-feet.*
1908.					
Aug. 21....	C. E. Allen	2.46	521	96	627
Sept. 3....	C. E. Allen	1.89	463	96	426
Sept. 11....	C. E. Allen	0.46	352	87	131
Sept. 15....	C. E. Allen	0.45	349	87	132
Nov. 1....	C. R. Adams	0.15	309	83	101
1909.					
Jan. 5....	C. R. Adams	2.75	1,460	107	752
Jan. 29....	C. R. Adams	3.96	1,700	107	1,400
April 18....	C. C. Covert	7.30	2,040	107	4,540
July 9....	Covert and Hoyt	2.00	491	102	555
July 12....	W. G. Hoyt	2.09	479	102	531
Oct. 4....	Hoyt and Williams	2.32	461	96	579

Current-meter Discharge Measurements of Raquette River at Piercefield, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
1910.		*Feet.*	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
Mar. 28......	C. C. Covert................	5.7	124	2,020	1.44	*a* 2,920
Mar. 31......	C. C. Covert................	6.6	124	2,020	1.82	*a* 3,670
May 27......	W. G. Hoyt................	5.25	124	1,920	1.26	*a* 2,430
July 8......	W. G. Hoyt................	2.22	97	548	1.07	586
Aug. 19......	W. G. Hoyt................	2.12	98	499	1.13	566

a Measurements made at highway bridge above dam. Pond above and underneath bridge full of pulp wood, which affected surface velocities.
Other measure made from boat at cable.

Mean Daily Discharge, Second-feet, of Raquette River at Piercefield, N. Y.

DAY.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.					
1....................................	......	456	93	98	238
2....................................	......	446	93	98	249
3....................................	......	436	93	98	249
4....................................	......	424	91	104	260
5....................................	......	406	91	106	249
6....................................	......	400	91	106	249
7....................................	......	394	97	115	400
8....................................	......	385	91	108	623
9....................................	......	318	91	120	700
10....................................	......	298	97	120	586
11....................................	......	179	97	125	430
12....................................	......	136	98	125	344
13....................................	......	136	101	123	270
14....................................	......	142	96	125	228
15....................................	......	134	96	130	228
16....................................	......	136	96	134	210
17....................................	......	134	96	136	250
18....................................	......	134	96	136	270
19....................................	......	134	97	136	260
20....................................	642	130	97	136	260
21....................................	634	134	98	136	318
22....................................	612	134	98	136	344
23....................................	604	136	98	136	568
24....................................	586	130	96	136	497
25....................................	568	130	97	136	306
26....................................	539	130	98	155	415
27....................................	525	130	98	176	344
28....................................	504	130	98	192	386
29....................................	490	110	98	189	868
30....................................	480	90	98	224	700
31....................................	462	......	98	......	700
Mean....................................	554	220	95.9	133	387

Mean Daily Discharge, Second-feet, of Raquette River at Piercefield, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1......	704	1,270	1,240	918	4,540	3,250	818	371	210	344	210	462
2......	748	1,430	1,500	993	4,320	3,250	818	371	249	344	210	386
3......	550	1,210	1,500	1,150	4,320	2,800	818	371	249	344	210	386
4......	497	1,210	1,500	210	4,320	2,650	794	371	228	344	249	318
5......	704	1,430	1,430	1,180	4,320	2,340	818	371	210	344	270	318
6......	725	1,430	1,430	1,120	4,320	2,800	642	371	219	400	270	462
7......	532	968	1,500	993	4,370	2,600	514	344	219	400	210	462
8......	623	1,270	1,570	1,710	4,320	2,340	497	318	228	400	270	430
9......	794	1,120	1,640	2,200	4,780	2,340	497	318	210	386	270	462
10......	228	1,500	1,360	1,940	4,780	2,380	462	318	238	400	270	462
11......	497	1,430	1,430	2,110	5,020	2,060	480	318	306	400	270	462
12......	794	1,460	1,540	2,380	5,020	2,020	462	318	386	400	270	210
13......	604	1,780	1,360	2,290	5,440	1,900	497	293	642	386	270	480
14......	642	642	604	3,560	5,500	1,710	497	293	662	358	192	462
15......	794	1,430	1,540	3,710	5,260	794	497	293	642	371	142	462
16......	868	1,330	1,430	4,000	5,200	794	462	293	586	371	249	462
17......	293	1,360	1,430	4,540	5,260	794	462	260	532	249	249	415
18......	604	1,540	1,360	4,660	5,260	818	446	228	430	344	249	400
19......	604	1,020	1,400	5,020	5,260	794	415	228	318	371	249	249
20......	642	2,160	1,210	5,260	4,780	662	415	228	371	371	249	400
21......	642	642	415	5,260	4,720	818	400	228	415	371	210	371
22......	604	514	1,120	5,260	4,200	918	400	228	415	371	210	400
23......	794	1,430	1,240	5,440	4,090	943	400	238	400	249	219	400
24......	210	1,540	1,150	5,380	4,260	968	400	260	371	210	219	371
25......	604	1,430	1,180	5,380	4,600	943	400	260	331	249	400	371
26......	642	1,500	1,020	5,140	4,200	943	371	238	249	249	480	210
27......	642	1,430	893	5,260	4,040	918	371	201	249	249	462	306
28......	993	1,270	238	4,960	3,660	868	371	210	249	249	210	400
29......	642	......	1,020	4,840	3,760	868	371	201	293	249	386	400
30......	1,430	......	1,120	4,720	3,870	843	371	201	331	249	462	400
31......	210	......	893	......	3,710	......	371	210	......	210	......	400

Mean Daily Discharge, Second-feet, of Raquette River at Piercefield, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	487	735	635	(3,820)	3,980	......	2,020	369	456	521	635	675
2......	218	715	755	(4,720)	3,980	......	1,680	316	426	218	667	595
3......	487	715	755	4,720	3,980	......	218	316	397	303	675	595
4......	472	(715)	755	4,780	4,040	......	218	290	90	521	707	90
5......	(480)	715	755	4,780	4,040	......	1,160	316	90	539	675	528
6......	487	342	441	4,840	3,870	......	1,000	316	441	521	101	576
7......	(472)	675	1,080	4,780	3,760	......	845	90	528	539	356	557
8......	456	755	1,600	4,780	3,560	......	576	90	521	557	576	487
9......	241	715	1,600	4,780	3,560	......	595	383	539	101	635	456
10......	487	(715)	1,600	4,540	3,560	......	218	487	557	186	920	456
11......	(487)	(675)	1,600	4,780	3,560	......	521	90	90	412	735	90
12......	487	675	1,600	4,780	3,500	......	557	90	1,020	521	778	......
13......	715	635	1,220	4,780	3,450	......	472	90	595	504	90	......
14......	715	755	2,020	4,660	3,050	......	557	90	472	521	397	......
15......	487	(755)	2,020	4,540	2,600	......	487	90	412	487	920	......
16......	241	755	2,060	4,320	2,750	......	456	90	456	101	995	......
17......	(356)	(755)	2,060	3,980	2,700	......	218	90	369	504	970	......
18......	472	755	2,060	3,920	2,650	......	487	218	105	557	920	......
19......	426	755	2,020	4,090	2,560	......	487	539	557	615	945	......
20......	487	755	1,900	3,560	2,290	......	504	383	557	635	90	......
21......	(487)	755	1,900	3,660	2,560	......	521	114	557	635	369	......
22......	487	755	1,860	3,560	2,750	......	539	90	557	635	635	......
23......	218	755	1,780	3,560	2,750	......	557	295	557	101	800	......
24......	655	755	1,780	3,050	2,750	......	218	456	557	290	895	......
25......	675	755	1,780	4,200	2,750	2,020	412	539	105	504	895	......
26......	675	845	2,020	3,980	2,560	1,860	539	504	218	539	945	......
27......	675	456	2,290	3,980	2,560	2,020	557	487	303	557	90	......
28......	675	(456)	3,250	4,090	2,560	2,560	557	105	539	603	383	......
29......	675	......	3,560	4,090	2,560	2,560	472	90	557	635	635	....
30......	521	......	4,090	3,980	2,560	2,020	456	412	521	105	675	......
31......	695	......	3,820	......	2,560	......	90	504	......	356	......	......

NOTE.—Gage heights questionable June 1 to 24 and December 12 to 31. Discharge for these periods withheld.

Monthly Discharge of Raquette River at Piercefield, N. Y.

[Drainage area, 723 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1908.					
August 20-31	642	462	554	0.766	0.34
September	456	90	220	0.304	0.34
October	101	91	95.9	0.133	0.15
November	224	98	133	0.184	0.21
December	868	210	387	0.535	0.62
1909.					
January	1,430	210	641	0.887	1.02
February	2,160	514	1,310	1.81	1.88
March	1,640	238	1,230	1.70	1.96
April	5,440	210	3,390	4.69	5.23
May	5,500	3,660	4,560	6.31	7.28
June	3,250	662	1,600	2.21	2.47
July	818	371	501	0.693	0.80
August	371	201	282	0.390	0.45
September	662	210	348	0.481	0.54
October	400	210	330	0.456	0.53
November	480	142	270	0.373	0.42
December	480	210	393	0.544	0.63
The year	5,500	142	1,230	1.71	23.21
1910.					
January	695	218	503	0.696	0.80
February	845	342	700	0.968	1.01
March	4,090	635	1,830	2.53	2.92
April	4,840	3,050	4,270	5.91	6.59
May	4,040	2,290	3,110	4.30	4.96
June	....	....	(2,040)	(2.82)	(2.28)
July	2,020	90	587	0.812	0.94
August	539	90	259	0.358	0.41
September	1,020	90	438	0.606	0.68
October	1,300	133	443	1.68	1.94
November	2,420	240	736	2.79	3.11

NOTE.— Discharge for June, 1910, based on records at Massena Springs.

RAQUETTE RIVER AT RAQUETTE FALLS, NEAR COREYS, N. Y.

The gaging station was established at Raquette Falls by the U. S. Geological Survey in coöperation with the State Water Supply Commission, August 27, 1908. The gaging station is located about midlength of Raquette Falls in Harrietstown, about eight miles up-stream from the village of Axton. The stream flows in one channel at all stages. The bed is of rock containing large boulders, but permanent in character. The current is sluggish at low stages of the stream, but is suitable for obtaining good gaging results at ordinary and higher stages. A cableway was erected at this station in 1909. Measurements were made, preceding the erection of the cableway, by wading at a cross-section about 2,000 feet down-stream. The record is not maintained during the winter season. The observer is C. A. DeLancett. The results of gagings at this station have been compiled from the reports of the New York State Water Supply Commission.

Current-meter Discharge Measurements of Raquette River at Raquette Falls, near Coreys, N. Y.

DATE.	Hydrographer.	Mean gage reading.	Total area.	Total width.	Corrected discharge.
			Square feet.	*Feet.*	*Second-feet.*
1908.					
Aug. 31......	C. E. Allen..................	1.25	95.5	58	99.2
Sept. 6......	C. E. Allen..................	1.21	93.4	55	92.0
Sept. 17......	C. E. Allen..................	0.90	80.7	50	59.8
Sept. 23......	C. E. Allen..................	0.85	79.0	49	53.9
Oct. 12......	C. R. Adams..................	1.40	98.1	40	154.0
1909.					
July 10*a*.....	Covert and Hoyt..............	1.91	185	93	258
July 14*a*.....	W. G. Hoyt..................	1.79	175	90	267
Oct. 3*b*.....	W. G. Hoyt..................	1.81	243	83	260
Nov. 7*b*.....	Hoyt and Covert..............	1.50	194	69	153

a Made by wading at foot of falls.
b Made from cable at regular section.

Current-meter Discharge Measurements of Raquette River at Raquette Falls, near Coreys, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet*	*Feet per second.*	*Second-feet.*
1910.						
April 1......	C. C. Covert................	5.8	106	623	5.99	3,730
May 26......	W. G. Hoyt..................	4.26	89	424	2.41	*a*1,020
July 7......	W. G. Hoyt..................	2.00	88	252	1.17	294
July 23......	C. C. Covert................	1.40	67	184	0.77	141
Nov. 7......	F. J. Shuttleworth...........	2.54	89	258	1.82	470

a Log jam below gage.

Mean Daily Discharge, Second-feet, of Raquette River at Raquette Falls, near Coreys, N. Y.

DAY.	Aug.	Sept.	Oct.	Nov.
1908.				
1	......	100	90	113
2	......	98	108	86.9
3	......	96	134	88.5
4	......	94	150	100
5	......	92	150	......
6	......	88.5	150	......
7	......	83.8	150	......
8	......	79.7	150	......
9	......	75.8	150	......
10	......	72.6	150	......
11	......	69.5	150	......
12	......	67.8	150	......
13	......	66.0	138	......
14	......	65.2	130	......
15	......	63.6	127	......
16	......	62.8	120	......
17	......	61.3	116	......
18	......	58.5	110	......
19	......	55.3	103	......
20	......	55.3	94	......
21	......	55.3	86.9	......
22	......	55.3	79.7	......
23	......	55.3	75.8	......
24	......	54.7	77.1	......
25	......	54.2	78.4	......
26	......	53.6	81.0	......
27	138	53.1	86.9	......
28	123	57.2	96.0	......
29	110	62.8	108	......
30	100	69.5	123	......
31	100	......	134	......

Mean Daily Discharge, Second-feet, of Raquette River at Raquette Falls, near Coreys, N. Y.

DAY.	July.	Aug.	Sept.	Oct.
1909.				
1	......	217	159	202
2	......	202	187	202
3	......	187	159	250
4	......	173	135	250
5	......	159	147	250
6	......	159	187	217
7	......	147	159	187
8	......	135	135	159
9	......	135	125	147
10	......	125	115	147
11	304	115	115	135
12	285	115	115	125
13	285	106	115	125
14	250	106	106	125
15	217	97	115	125
16	217	125	115	115
17	217	147	115	115
18	250	202	115	115
19	285	250	115	115
20	304	268	106	97
21	285	250	89	106
22	250	217	89	125
23	250	187	89	159
24	250	159	187	187
25	323	135	135	159
26	323	135	115	147
27	285	135	115	147
28	250	135	135	147
29	250	135	159	135
30	217	135	202	135
31	234	147	......	135

Mean Daily Discharge, Second-feet, of Raquette River at Raquette Falls, near Coreys, N. Y.

DAY.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.										
1	......	3,660	1,640	1,750	420	170	190	265	420	320
2	......	3,740	1,860	1,970	350	170	215	290	420	320
3	......	3,430	1,970	1,970	320	150	215	290	420	320
4	......	3,130	2,700	1,450	320	215	240	290	420	320
5	......	3,130	3,430	1,280	320	265	265	290	420	320
6	......	2,980	3,130	1,360	320	265	460	290	420	320
7	......	3,130	2,840	1,450	290	240	460	290	460	350
8	......	3,280	2,840	1,640	265	215	460	290	460	......
9	......	3,130	2,700	1,540	265	215	420	290	460	......
10	......	3,130	2,700	1,540	240	215	385	290	460	......
11	......	3,130	2,570	1,540	240	190	350	290	420	......
12	......	2,700	2,320	1,540	240	190	350	290	420	......
13	......	2,440	2,080	1,360	240	190	350	290	420	......
14	......	2,200	1,860	1,280	215	190	320	290	420	......
15	......	2,200	1,750	1,120	190	240	320	290	420	......
16	......	1,970	1,750	1,120	190	240	290	290	385	......
17	......	1,970	1,750	1,120	190	265	290	290	385	......
18	......	1,970	1,860	1,120	190	290	290	265	385	......
19	......	2,200	1,860	1,040	170	265	290	265	350	......
20	......	2,700	1,450	970	170	240	290	265	350	......
21	......	2,440	1,540	900	170	240	265	240	350	......
22	......	2,700	1,360	830	170	215	265	240	350	......
23	......	2,440	1,040	710	150	190	265	265	350	......
24	......	2,200	1,200	655	150	190	265	265	320	......
25	......	1,970	1,360	600	150	215	265	320	320	......
26	......	1,860	1,540	600	170	240	240	385	320	......
27	......	1,750	1,750	550	190	240	240	385	320	......
28	......	1,750	2,320	505	190	215	240	385	320	......
29	......	1,640	1,200	460	170	215	240	385	320	......
30	2,770	1,640	1,280	420	170	190	240	420	350	......
31	3,430	......	1,750	......	170	190	......	420	......	......

NOTE.— Daily discharge based on a fairly well defined rating. Ice conditions which prevailed at this station during December, render the giving of daily discharge impossible.

Monthly Discharge of Raquette River at Raquette Falls, near Coreys, N. Y.
[Drainage area, 418 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1908.*					
August 27-31	129	106	115	0.275	0.05
September	106	49	70.8	0.169	0.19
October	135	81	114	0.273	0.31
1909.					
July 11-31	323	217	263	0.629	0.49
August	268	97	159	0.380	0.44
September	202	89	132	0.316	0.35
October	250	97	154	0.368	0.42
1910.					
April	3,740	1,640	2,550	6.10	6.81
May	3,430	1,040	1,980	4.74	5.46
June	1,970	420	1,150	2.75	3.07
July	420	150	226	0.541	0.62
August	290	150	218	0.522	0.60
September	460	190	299	0.715	0.80
October	420	240	304	0.727	0.84
November	460	320	388	0.928	1.04

* Monthly discharge given above, for 1908, supersedes those published in the fourth annual report.

BOG RIVER.

DESCRIPTION.

Bog river is a tributary of Raquette river, which enters the head of Tupper lake. Upper Raquette river enters the easterly arm of Tupper lake. The water-level in Tupper lake is controlled to some extent by the dam of the International Paper Company at Piercefield. The drainage basin of Bog river is shown in part on the Tupper lake quadrangle of the U. S. Geological Survey topographic map. Bog river joins the outlet of Little Tupper lake and Round lake about one and one-half miles up-stream from the head of Tupper lake. The drainage basin is all at high altitude, the elevation of Tupper lake being about 1,542 feet and that of Little Tupper lake, 1,718 feet. Bog river is a relatively sluggish, winding stream. Its drainage basin above the junction of Little Tupper lake outlet contains numerous small lakes and ponds. Substantially the entire drainage tributary to Bog river is forest covered, excepting lakes and marsh areas.

BOG RIVER NEAR TUPPER LAKE, N. Y.

A gaging station was established by the U. S. Geological Survey in coöperation with the New York State Water Supply Commission on Bog river below the inflow of Little Tupper lake outlet, August 24, 1908. The gage is located about one mile up-stream from the head of Tupper lake. A cableway was erected at the gaging station for the purpose of making discharge measurements during the summer of 1909. Previous measurements were made by wading. The stream is confined to a single channel at all stages. Gage readings were not taken each day during 1909, but were taken at frequent intervals by engineers and observers. The regimen of the stream is controlled to some extent by power development above the gaging station. The results here given have been compiled from the reports of the New York State Water Supply Commission.

Current-meter Discharge Measurements of Bog River near Tupper Lake, N. Y.

DATE.	Hydrographer.	Mean gage reading.	Total area.	Total width.	Corrected discharge.
			Square feet.	*Feet.*	*Second-feet.*
1908.					
Aug. 24	Adams and Allen	1.55	113	55	97.7
Aug. 29	C. E. Allen	1.50	108	54	93.4
Sept. 4	C. E. Allen	1.36	97	54	63.9
Sept. 16	C. E. Allen	0.84	65	43	14.8
Sept. 20	C. E. Allen	0.74	61	39	12.2
Oct. 7	C. R. Adams	1.15	82	47	42.8
1909.					
July 8*a*	Covert and Hoyt	1.38	103	50	64
July 13*a*	W. G. Hoyt	1.40	105	49	70
Sept. 6*a*	W. G. Hoyt	1.16	89	47	41
Oct. 1*b*	W. G. Hoyt	1.17	87	44	42
Oct. 14*b*	C. C. Covert	1.24	100	49	54

Current-meter Discharge Measurements of Bog River near Tupper Lake, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1910.						
April 2	C. C. Covert	2.82	72	220	1.67	368
May 20	W. G. Hoyt	5.06	65	245	2.02	444
May 25	W. G. Hoyt	3.35	75	289	2.30	664
July 6	W. G. Hoyt	1.53	51	108	0.94	101

a Measurement made by wading at station. *b* Measurement made from cable.

Mean Daily Discharge, Second-feet, of Bog River near Tupper Lake, N. Y.

DAY.	Aug.	Sept.	Oct.	Nov.
1908.				
1	......	85.9	36.2	......
2	......	82.4	36.2	......
3	......	79	43.4	......
4	......	66.5	37.2	......
5	......	66.5	37.2	......
6	......	63.6	35.2	16.7
7	......	60.9	34.3	......
8	......	60.9	38.2	......
9	......	50.6	36.2	......
10	......	36.2	35.2	......
11	......	26.7	31.7	......
12	......	19.7	40.2	......
13	......	18.5	34.3	......
14	......	17.3	29.2	......
15	......	16.7	24.5	......
16	......	16.2	20.4	......
17	......	14.1	16.7	......
18	......	12.8	13.7	......
19	......	12.0	11.2	......
20	......	11.6	9.2	......
21	......	11.6	7.5	......
22	......	11.6	7.5	......
23	......	11.6	7.5	......
24	99	11.6	......	......
25	99	11.6	......	......
26	97.1	11.6	......	......
27	97.1	11.6	......	......
28	91.4	14.6	......	......
29	89.5	18.5	......	......
30	91.4	23.7	......	......
31	89.5	......	......	......
Mean	94.2	31.8	27.1	......

Mean Daily Discharge, Second-feet, of Bog River near Tupper Lake, N. Y.

DAY.	July.	Aug.	Sept.	Oct.	Nov.
1909.					
1	......	48.1	38.2	42.4	......
2	......	49.3	38.2	45.6	......
3	......	......	38.2	......	......
4	......	......	37.2	......	......
5	......	......	41.3	......	......
6	......	......	41.3	......	58.2
7	......	......	37.2	......	......
8	......	37.2	38.2	......	......
9	63.9	......	38.2	58.2	58.2
10	......	43.4	38.2	......	......
11	......	34.3	39.2	......	......
12	......	48.1	39.2	......	......
13	70.9	49.3	38.2	......	......
14	......	36.2	......	50.6	72.4
15	......	34.3	......	......	......
16	......	38.2	......	51.8	72.4
17	63.6	37.2	......	......	......
18	......	38.2	45.6	......	......
19	......	38.2	......	......	......
20	......	38.2	......	......	72.4
21	41.3	45.6	......	......	......
22	......	......	......	......	......
23	......	......	......	72.4	109
24	......	38.2	......	......	......
25	......	......	45.6	......	......
26	......	38.2	......	......	......
27	60.9	39.2	......	......	58.2
28	......	38.2	......	......	......
29	......	......	......	......	......
30	......	38.2	45.6	89.5	72.4
31	......	38.2	......	......	......

Mean Daily Discharge, Second-feet, of Bog River near Tupper Lake, N. Y.

DAY.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1910.								
1	......	186	625	60	28	28	72	100
2	......	1,650	580	60	28	37	85	100
3	495	1,580	535	60	28	48	85	100
4	340	325	535	48	28	60	72	100
5	495	825	455	48	28	60	85	115
6	415	720	375	72	28	48	85	131
7	208	1,230	310	85	28	48	85	131
8	770	254	280	85	28	60	72	115
9	825	1,610	280	72	37	72	60	115
10	670	1,580	340	48	48	85	60	115
11	825	1,470	375	60	48	92	60	131
12	1,060	1,130	340	60	48	85	72	148
13	770	340	310	48	37	85	85	148
14	720	230	280	37	28	72	85	166
15	625	186	280	37	28	72	100	230
16	1,690	186	280	37	28	60	85	254
17	1,470	186	310	37	37	48	72	230
18	1,330	230	375	37	37	60	72	230
19	340	208	455	37	28	60	60	230
20	1,000	1,330	375	37	28	60	60	230
21	1,300	1,260	310	37	28	72	85	230
22	148	495	310	37	28	60	100	230
23	495	455	254	37	28	60	85	230
24	186	535	186	37	28	60	85	230
25	48	648	166	28	28	60	85	254
26	100	625	131	28	20	60	100	254
27	148	625	85	28	14	60	100	186
28	148	625	72	37	14	60	115	166
29	166	625	72	37	10	60	115	166
30	1,650	670	72	48	14	60	100	148
31	......	625	......	37	20	......	100	......

NOTE.— This station discontinued during the period of ice conditions. Daily discharges for the open channel periods, based on a well defined rating.

Monthly Discharge of Bog River near Tupper Lake, N. Y.
[Drainage area, 132 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1908.					
August 24–31	99	89.5	94.2	0.714	0.21
September	85.9	11.6	32.1	0.243	0.27
October 1–23	43.4	7.5	27.1	0.205	0.18
1909.					
July 8–31	....	....	(60)	0.454	0.44
August	....	....	(42)	0.317	0.36
September	....	....	(44)	0.333	0.37
October	....	....	(62)	0.470	0.54
November	....	....	(68)	0.516	0.58
1910.					
April 3–30	1,690	48	658	4.98	5.19
May	1,650	186	730	5.53	6.38
June	625	72	312	2.36	2.63
July	85	28	47.0	0.356	0.41
August	48	14	28.8	0.218	0.25
September	92	28	61.7	0.467	0.52
October	115	60	83.3	0.631	0.73
November	254	100	140	1.06	1.18

NOTE.—Monthly estimates for 1909 are based on gage readings, discharge measurements and the record at Raquette Falls.

OSWEGATCHIE RIVER.

DESCRIPTION.

Oswegatchie river has its source in the region of lakes and timber swamps in the southern part of St. Lawrence county. The largest of the lakes is Cranberry lake, which affords valuable storage to water-power users on its outlet, East branch of Oswegatchie river. East and west branches flow in a general northwesterly direction and unite near Talcville. From Gouverneur to Oxbow the river flows southwestward; it then turns sharply and flows northeastward to Rensselaer Falls, turns again to the northwest, receives the outlet of Black lake at Galilee, and finally enters the St. Lawrence at Ogdensburg.

OSWEGATCHIE RIVER NEAR OGDENSBURG, N. Y.

The gaging station was established May 16, 1903, by Robert E. Horton. It is located at Eel wier bridge, just below the junction at Oswegatchie river and Black lake outlet. This gaging station is maintained by the U. S. Geological Survey in coöperation with this Department.

The channel is in rock and is partly artificial, rock underneath the bridge having been removed by blasting to increase the bridge opening. The bridge consists of two spans, the right being 129.6 feet long and the left 130.1 feet.

Discharge measurements are made from the down-stream side of the bridge. The initial point for soundings is the top of the face of the right abutment, down-stream side.

A standard chain gage, which is observed twice daily by Joseph H. LaRue is attached to the ironwork of the bridge on the up-stream side of the right-hand span. The bench-mark is a square chisel draft on the up-stream side of the right-hand abutment; for which an arbitrary elevation of 100.0 is assumed. The datum of the gage is El. 83.28 or 16.72 feet below the bench-mark.

Mean Daily Gage Height, in Feet, of Oswegatchie River near Ogdensburg, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	5.1	6.1	5.7	6.9	5.3	5.4	4.7	4.4	4.6	4.7	5.8	5.9
2......	5.0	6.0	6.2	6.7	5.3	5.4	4.7	4.5	4.6	4.7	6.0	5.8
3......	5.0	5.8	7.0	6.7	5.3	5.3	4.7	4.5	4.6	4.7	5.8	5.8
4......	5.2	5.8	7.5	6.7	5.3	5.3	4.8	4.5	4.6	4.7	5.7	5.8
5......	5.0	5.6	8.1	6.7	5.4	5.3	4.8	4.5	4.6	4.7	5.7	5.8
6......	5.0	5.5	8.3	6.5	5.6	5.4	4.7	4.5	4.7	4.7	5.6	5.8
7......	4.9	5.5	8.8	6.5	6.2	5.3	4.7	4.5	4.9	4.7	5.6	5.7
8......	4.9	5.5	8.9	6.2	6.1	5.2	4.7	4.6	4.9	4.8	5.6	5.7
9......	4.9	5.3	9.1	6.2	6.1	5.2	4.7	4.5	4.9	4.9	5.6	5.6
10......	5.0	5.2	9.1	6.1	5.9	5.2	4.6	4.6	4.9	4.9	5.6	5.5
11......	5.0	5.1	9.0	6.0	5.9	5.2	4.6	4.6	4.9	5.0	6.0	5.4
12......	4.9	5.1	8.6	5.9	5.9	5.5	4.6	4.7	4.9	5.2	6.0	5.3
13......	4.9	5.1	8.5	5.9	5.7	5.5	4.7	4.7	5.0	5.2	6.1	5.3
14......	4.8	5.0	8.3	5.8	5.6	5.3	4.7	4.7	4.9	5.3	6.2	5.2
15......	4.8	5.0	7.9	5.6	5.6	5.3	4.7	4.7	5.0	5.3	6.3	5.2
16......	4.8	5.0	7.6	5.6	5.5	5.3	4.6	4.7	4.9	5.3	6.3	5.1
17......	4.8	4.9	7.3	5.4	5.4	5.3	4.6	4.7	4.9	5.3	6.2	5.1
18......	4.8	4.9	6.9	5.4	5.3	5.1	4.6	4.7	4.9	5.3	6.1	5.1
19......	4.8	4.9	6.6	5.4	5.2	5.1	4.6	4.6	4.9	5.2	6.0	5.1
20......	5.0	4.9	6.6	5.6	5.1	5.1	4.4	4.6	4.9	5.2	6.0	5.0
21......	5.0	4.9	6.6	5.6	5.3	5.1	4.4	4.7	4.8	5.2	6.0	5.0
22......	5.2	4.9	6.6	5.6	5.3	5.1	4.4	4.7	4.8	5.1	6.0	5.0
23......	5.5	5.0	6.6	5.6	5.3	5.1	4.5	4.7	4.8	5.1	5.9	5.0
24......	6.0	5.0	6.6	5.6	5.3	5.0	4.5	4.6	4.8	5.0	5.9	5.0
25......	6.2	5.0	6.8	5.5	5.4	5.0	4.5	4.6	5.0	5.0	5.8	5.0
26......	6.4	5.0	6.8	5.6	5.5	5.0	4.5	4.6	4.9	5.0	5.8	5.0
27......	6.4	5.0	6.9	5.6	5.5	5.0	4.5	4.6	4.9	5.0	5.8	5.0
28......	6.5	5.2	7.1	5.3	5.4	4.9	4.5	4.6	4.8	5.2	5.9	5.1
29......	6.4	......	7.1	5.3	5.5	4.8	4.5	4.6	4.8	5.3	6.0	5.1
30......	6.3	......	7.1	5.3	5.5	4.8	4.5	4.6	4.8	5.5	6.0	5.1
31......	6.1	......	7.2	......	5.4	......	4.4	4.6	......	5.8	......	5.2

Current-meter Discharge Measurement of Oswegatchie River near Ogdensburg, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Ft. per second.*	*Second-feet.*
1910. Aug. 24......	W. G. Hoyt..................	473	150	297	2.35	696

Mean Daily Discharge, Second-feet, of Oswegatchie River near Ogdensburg, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	1,380	3,730	2,640	6,070	1,770	1,970	720	330	580	720	2,890	3,160
2	1,200	3,440	4,020	5,480	1,770	1,970	720	450	580	720	3,440	2,890
3	1,200	2,890	6,360	5,480	1,770	1,770	720	450	580	720	2,890	2,890
4	1,570	2,890	7,850	5,480	1,770	1,770	870	450	580	720	2,640	2,890
5	1,200	2,400	9,660	5,480	1,970	1,770	870	450	580	720	2,640	2,890
6	1,200	2,180	10,300	4,890	2,400	1,970	720	450	720	720	2,400	2,890
7	1,030	2,180	11,800	4,890	4,020	1,770	720	450	1,030	720	2,400	2,640
8	1,030	2,180	12,100	4,020	3,730	1,570	720	580	1,030	870	2,400	2,640
9	1,030	1,770	12,700	4,020	3,730	1,570	720	450	1,030	1,030	2,400	2,400
10	1,200	1,570	12,700	3,730	3,160	1,570	580	580	1,030	1,030	2,400	2,180
11	1,200	1,380	12,400	3,440	3,160	1,570	580	580	1,030	1,200	3,440	1,970
12	1,030	1,380	11,200	3,160	3,160	2,180	580	720	1,030	1,570	3,440	1,770
13	1,030	1,380	10,900	3,160	2,640	2,180	720	720	1,200	1,570	3,730	1,770
14	870	1,200	10,300	2,890	2,400	1,770	720	720	1,030	1,770	4,020	1,570
15	870	1,200	9,050	2,400	2,400	1,770	720	720	1,200	1,770	4,310	1,570
16	870	1,200	8,150	2,400	2,180	1,770	580	720	1,030	1,770	4,310	1,380
17	870	1,030	7,250	1,970	1,970	1,770	580	720	1,030	1,770	4,020	1,380
18	870	1,030	6,070	1,970	1,770	1,380	580	720	1,030	1,770	3,730	1,380
19	870	1,030	5,180	1,970	1,570	1,380	580	580	1,030	1,570	3,440	1,380
20	1,200	1,030	5,180	2,400	1,380	1,380	330	580	1,030	1,570	3,440	1,200
21	1,200	1,030	5,180	2,400	1,770	1,380	330	720	870	1,570	3,440	1,200
22	1,570	1,030	5,180	2,400	1,770	1,380	330	720	870	1,380	3,440	1,200
23	2,180	1,200	5,180	2,400	1,770	1,380	450	720	870	1,380	3,160	1,200
24	3,440	1,200	5,180	2,400	1,770	1,200	450	580	870	1,200	3,160	1,200
25	4,020	1,200	5,780	2,180	1,970	1,200	450	580	1,200	1,200	2,890	1,200
26	4,600	1,200	5,780	2,400	2,180	1,200	450	580	1,030	1,200	2,890	1,200
27	4,600	1,200	6,070	2,400	2,180	1,200	450	580	1,030	1,200	2,890	1,200
28	4,890	1,570	6,660	1,770	1,970	1,030	450	580	870	1,570	3,160	1,380
29	4,600	......	6,660	1,770	2,180	870	450	580	870	1,770	3,440	1,380
30	4,310	......	6,660	1,770	2,180	870	450	580	870	2,180	3,440	1,380
31	3,730	......	6,960	......	1,970	......	330	580	......	2,890	......	1,570
Mean	1,960	1,670	7,780	3,240	2,270	1,550	578	588	924	1,350	3,210	1,840

Monthly Discharge of Oswegatchie River near Ogdensburg, N. Y.

[Drainage area, 1,580 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
January	4,890	870	1,960	1.24	1.43
February	3,730	1,030	1,670	1.06	1.10
March	12,700	2,640	7,780	4.92	5.67
April	6,070	1,770	3,240	2.05	2.29
May	4,020	1,380	2,270	1.44	1.66
June	2,180	870	1,550	0.981	1.09
July	870	330	578	0.366	0.42
August	720	330	588	0.372	0.43
September	1,200	580	924	0.585	0.65
October	2,890	720	1,350	0.854	0.98
November	4,310	2,400	3,210	2.03	2.26
December	3,160	1,200	1,840	1.16	1.34
The year	12,700	330	2,250	1.42	19.32

LAKE ONTARIO DRAINAGE.

GENERAL FEATURES.

In the northwestern part of the state of New York, between Niagara and St. Lawrence river, is an area aggregating about 12,400 square miles drained by streams which flow into Lake Ontario. The divide which controls this drainage is very irregular. Extending to the south and southeast from Fort Niagara, it passes around the head waters of the Genesee a short distance into Pennsylvania; thence re-entering New York it runs southward and eastward from the interior group of lakes, turns to the north, encircles the sources of Black river, turns again to the west, and descends to the lake. The country thus included is level or gently undulating in the counties bordering the lake, but farther south it becomes more rolling, and a series of ridges, gradually increasing in height, stretch down between Cayuga and Seneca, and their companion lakes, finally becoming merged with the elevated broken country forming the principal divide, the abrupt slopes of which attain altitudes of from 2,000 to 2,500 feet about the head waters of the Genesee.

The easterly, or Black river lobe of the drainage basin receives the run-off from the southwestern slope of the Adirondack mountains — largely a rugged and forest-covered area — receiving heavy precipitation, especially in the winter.

Drift deposits are generally scattered over the section, and the soil is in part derived from that source and in part from the disintegration of native rocks.

The principal streams of the area are the Oswego, formed by the union of Seneca and Oneida rivers, which drain the chain of lakes in central New York, the Genesee, Salmon and Black rivers.

BLACK RIVER DRAINAGE BASIN.

BLACK RIVER.

DESCRIPTION.

Black river rises in the western part of Hamilton county, N. Y., flows southwestward across Herkimer county into Oneida county, turns near Forestport and runs somewhat west of north through Lewis county to eastern Jefferson county, and then flows westward to Black river bay, at the eastern extremity of Lake Ontario. The upper part of the basin is very rugged and mountainous and contains a large number of lakes.

The regimen of the river is controlled by storage on its upper tributaries, including Beaver river at Beaver, a series of reservoirs at the head waters of Moose river, and additional reservoirs at Forestport and on the head waters of the main river.

Water is diverted from Black river through Forestport feeder to supply the Black river canal at Boonville. A portion of this diverted water flows northward from Boonville and enters Black river again at Lyons Falls; the remainder flows southward through the Black river canal and enters the Erie canal at Rome.

The results of gagings of this diversion may be found in the State Engineer's Report for 1906, Supplement, page 36, and also on pages 597–598 of the report for 1907.

BLACK RIVER NEAR FELTS MILLS, N. Y.

This station was established by Robert E. Horton, August 29, 1902, and has since been maintained by the U. S. Geological Survey in coöperation with this Department. It is located at the dam of the Lefebvre Paper Company, formerly owned by the Black River Traction Company, near the village of Felts Mills. The dam is nine miles up-stream from Watertown and seven miles up-stream from the old Huntingtonville gaging station on this stream. The drainage area is estimated at 1,851 square miles, or 37.5 square miles less than at Huntingtonville. The intervening area is mainly drained by two small streams, Townsend and Rutland Hollow creeks.

During the summer of 1910 the timber dam formerly used at this gaging station was replaced by a masonry dam located a few rods farther down-stream. The new dam has a horizontal crest 3.75 feet in width. The down-stream face slopes with a batter of about 1 on 1. The main crest, which is 300.45 feet in length, is substantially level. A discharge curve for this dam, using suitable coefficients, has been prepared, but the record for the low water season of 1910 is somewhat approximate, owing to the changing of conditions during the construction of the dam, preceding the removal of the old, or upper dam, which had a somewhat higher crest elevation.

The gage, which was read twice daily during 1909, at 7 a. m. and 6 p. m., is attached vertically to a crib at the left-hand side of the stream above the mill. Correction is made to the gage readings for velocity of approach during high water. The discharge over the spillways has been calculated by means of the weir formula, using coëfficients derived from experiments of the United States Geological Survey for a dam of similar cross-section.

A wood pulp mill was constructed adjacent to this dam and has been in operation in 1907 and subsequent years. The mill contains four 72-inch and one 45-inch Smith-McCormick turbines. A record is kept of the hours run, and gate opening of each wheel, as well as of the head under which they operate.

The results obtained at this station in previous years may be found in the report of the State Engineer and Surveyor for 1906, Supplement, pages 36--40; 1907, page 381; 1908, page 425; 1909, page 340.

Mean Daily Discharge, Second-feet, of Black River near Felts Mills, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	1,462	2,546	6,079	13,849	2,842	3,913	902	1,189	2,142	2,746	2,946	1,413
2	1,165	2,378	8,283	14,676	2,967	4,090	861	869	1,903	2,562	2,558	1,413
3	2,123	2,420	10,472	14,676	3,658	3,468	100	902	1,864	2,353	2,474	1,207
4	1,246	2,128	13,137	13,029	4,289	3,578	100	924	1,784	2,311	2,474	1,207
5	1,370	2,036	14,161	11,211	6,024	2,842	924	1,317	2,266	2,104	2,906	1,207
6	1,700	998	13,849	9,823	6,495	3,205	896	3,263	2,266	2,144	3,448	1,040
7	1,700	1,913	14,827	8,319	2,647	3,468	896	3,406	1,945	2,661	3,237	1,040
8	1,320	1,341	14,553	8,086	4,747	4,371	868	3,143	1,905	2,784	2,964	873
9	1,040	1,597	13,481	7,319	4,128	5,045	832	2,620	1,786	2,784	3,081	873
10	1,848	1,796	11,910	6,808	3,683	4,694	323	2,161	1,554	2,394	3,631	1,040
11	1,639	1,837	7,704	6,136	3,683	4,024	1,124	1,999	1,372	2,025	5,158	1,207
12	1,389	1,718	8,231	5,183	3,534	3,287	933	2,693	1,168	1,826	3,631	1,413
13	1,608	555	6,304	4,530	3,123	4,042	868	3,519	1,286	1,786	4,312	1,597
14	2,169	2,018	6,291	3,933	2,699	3,500	896	2,336	1,231	1,786	3,121	1,498
15	1,369	1,597	4,884	3,448	2,151	3,197	938	2,088	1,231	1,786	2,722	1,624
16	1,165	1,637	4,561	3,139	4,740	3,081	922	2,126	1,190	1,594	2,516	1,564
17	1,805	1,716	3,496	2,545	4,233	2,661	754	1,786	1,190	1,268	2,349	1,442
18	1,303	2,005	3,365	2,545	4,816	2,607	1,365	1,865	1,044	1,259	2,182	873
19	1,352	1,967	3,605	2,842	5,077	1,888	901	1,983	1,190	1,259	2,019	1,442
20	1,608	1,249	4,094	4,560	5,699	3,159	911	2,023	1,231	1,308	1,888	1,317
21	2,128	2,269	6,134	3,947	3,143	2,307	901	2,023	1,190	1,317	1,655	1,067
22	2,800	1,921	7,255	3,469	2,842	2,142	902	1,983	1,190	1,217	1,352	1,067
23	4,530	1,963	7,731	2,842	3,500	1,903	863	1,877	1,190	......	1,475	1,067
24	6,715	2,046	8,498	3,029	3,465	1,594	515	1,435	1,190	1,268	1,655	1,067
25	6,183	2,130	8,753	3,635	4,062	1,511	1,183	1,090	1,190	1,268	2,019	873
26	5,785	2,509	10,137	3,386	5,045	201	933	1,050	1,231	1,317	2,151	1,067
27	5,567	1,888	11,978	3,980	4,062	1,231	942	1,035	1,236	1,826	1,888	1,216
28	3,632	3,714	11,715	3,683	3,733	996	933	1,035	1,231	2,946	1,655	1,337
29	2,823	......	11,715	3,980	3,931	996	942	1,020	1,246	3,181	1,655	1,478
30	2,151	......	11,211	2,829	3,941	966	881	1,040	2,746	2,282	1,413	1,796
31	2,517	......	10,708	......	3,765	......	674	1,058	......	3,237	......	2,242
Mean	2,426	1,925	9,004	6,048	3,959	2,800	838	1,834	1,506	2,020	2,551	1,276

Monthly Discharge of Black River near Felts Mills, N. Y.
[Drainage area, 1,851 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
January	6,715	1,040	2,426	1.311	1.508
February	3,714	555	1,925	1.040	1.082
March	14,827	3,365	9,004	4.864	5.594
April	14,676	2,545	6,048	3.267	3.659
May	6,495	2,151	3,959	2.139	2.460
June	5,045	201	2,800	1.513	1.695
July	1,365	100	838	0.452	0.520
August	3,519	869	1,834	0.991	1.140
September	2,746	1,044	1,506	0.814	0.912
October	3,237	1,217	2,020	1.091	1.255
November	5,158	1,352	2,551	1.378	1.543
December	2,242	873	1,276	0.689	0.792

MOOSE RIVER DRAINAGE BASIN.

DESCRIPTION.

Moose river is tributary to Black river at Lyons Falls, N. Y., joining Black river just above the head of the fall of about 50 feet. The drainage of Moose river lies chiefly in Hamilton and Herkimer counties and comprises a wild, rugged and little inhabited region largely forest covered, but containing also large tracts of cut and burned-over lands, numerous and extensive swamps and lakes. The stream above the gaging station near McKeever comprises three main branches. The south branch is chiefly broad and sluggish. The area tributary to this branch contains extensive swamps and marshes and but few lakes, the most important lakes being the Limekill and Little Moose lakes. The middle branch is substantially a continuous chain of lakes, known as the Fulton Chain, extending from Old Forge a distance of about 15 miles up-stream through eight different lakes. The outflow from Fulton Chain is artifically controlled by a State dam at Old Forge. The first to fourth lakes, inclusive, are at elevation 1,706 feet above tide. There is also a dam at the outlet of the sixth lake. Sixth, seventh and eighth lakes are at elevations 1,785 to 1,788 feet above tide. The north branch of the stream is made up of a large number of scattered lakes, the most important one being Big Moose lake. The lower course of the north branch is sluggish and tortuous. The drainage basin above McKeever is nearly all shown on the Big Moose, Raquette Lakes, Old Forge and West Canada Lakes quadrangles of the U. S. Geological Survey topographic maps.

MOOSE RIVER AT MOOSE RIVER, N. Y.

A gaging station was established June 5, 1900, at Moose River village by Robert E. Horton, and has since been maintained by the United States Geological Survey in coöperation with this Department.

The stream is smooth above the gaging station to the foot of McKeever dam, two miles up-stream, but a short distance above the gage it is divided by an island, which creates an ice jam during winter and spring freshets. A short distance below the station a fall occurs. The bed of the stream is of cobble with occasional boulders, the current is smooth, and the depth is fairly uniform. The stream freezes over in winter, alternate layers of ice and snow or slush often forming in such a manner as to prevent discharge measurements being made.

A cableway, having a clear span of 269 feet, was erected in June, 1903, from which current-meter measurements have since been made. The initial point for soundings is the left support of the cable.

The gage, which is read twice daily by Chris Hannon, consists of a graduated board scale, attached to posts on the left bank of the stream, and comprises a high-water and a low-water section. During the ice season the gage is read once each week. The gage was carried out by an ice freshet in February, 1903, and was replaced at a slightly different elevation. The bench-mark is on the top of a boulder on the left bank, 300 feet up-stream from the cableway. The elevation of the bench-mark is arbitrarily assumed at 100.00. The zero mark of the gage was elevation 84.64 prior to February 28, 1903, and has been elevation 84.47, or 15.53 feet below the bench-mark, since February 28, 1903.

Mean Daily Gage Height, in Feet, of Moose River at Moose River, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	1.10	......	7.10	6.20	4.30	2.40	0.90	0.95	0.85	3.10	2.50	1.30
2	1.00	......	6.95	6.10	4.20	2.90	0.95	0.95	0.80	2.85	2.50	1.20
3	1.00	......	6.50	5.95	4.20	3.25	0.90	0.95	0.70	2.80	2.60	1.35
4	1.25	......	5.65	5.80	4.10	2.90	1.00	2.40	0.80	2.70	2.60	0.00
5	1.35	......	5.10	5.20	4.20	2.90	1.10	4.10	0.80	2.55	2.65	1.45
6	1.55	......	4.80	5.05	4.35	3.20	1.20	3.20	0.90	2.40	2.65	1.70
7	1.70	......	4.80	5.35	4.05	3.55	1.10	2.95	1.05	2.25	2.60	1.60
8	1.70	......	4.70	5.10	3.75	3.75	0.95	2.65	1.40	2.20	2.45	1.35
9	......	......	4.80	4.35	3.40	3.70	1.00	2.30	1.35	2.05	2.35	0.95
10	......	......	4.80	3.90	3.10	3.55	0.90	2.45	1.30	2.00	2.30	0.80
11	......	......	4.65	3.35	2.80	3.25	0.90	3.00	1.30	1.90	2.20	0.80
12	......	......	4.50	3.15	2.45	3.20	0.80	3.35	1.40	1.80	2.10	0.70
13	......	......	4.35	3.00	2.10	2.90	0.80	3.10	1.35	1.65	2.10	0.70
14	......	......	4.30	2.95	1.60	2.40	0.80	2.70	1.45	1.60	2.00	0.80
15	......	......	4.20	2.75	0.30	2.20	0.80	2.60	1.45	1.60	2.00	0.80
16	......	......	4.00	2.70	1.20	2.05	0.80	2.50	1.30	0.00	1.90	0.90
17	......	......	3.55	2.70	1.40	2.00	0.30	2.35	1.40	1.60	1.75	0.80
18	......	......	3.30	2.60	1.65	1.90	0.80	2.15	1.40	1.60	1.70	0.70
19	......	......	3.10	2.60	2.00	1.80	0.90	2.00	1.25	1.70	1.60	0.70
20	......	......	2.85	2.50	2.30	1.70	0.80	1.95	1.20	1.80	1.50	0.80
21	......	......	2.60	2.50	2.45	1.60	0.80	1.80	1.30	1.95	1.50	0.80
22	......	......	2.85	2.40	2.70	1.50	0.70	1.65	1.30	1.95	1.50	0.70
23	......	......	3.30	2.40	3.00	1.30	0.70	1.45	1.40	2.00	1.50	0.80
24	......	......	4.05	2.40	3.25	0.30	0.80	1.20	1.40	2.15	1.60	0.90
25	......	......	5.65	2.40	2.95	1.15	0.90	0.95	1.50	2.35	1.50	0.95
26	......	......	6.35	3.10	2.90	1.15	0.95	0.75	1.50	2.55	1.50	0.80
27	......	......	6.35	3.85	2.80	1.10	0.90	0.55	1.65	2.35	1.40	1.25
28	......	......	5.95	3.80	2.70	1.05	0.80	0.00	1.95	2.30	1.40	1.70
29	......	......	6.30	3.95	2.55	1.00	0.75	0.60	2.40	2.20	1.40	1.75
30	......	......	6.15	4.25	2.35	0.90	0.90	0.95	3.05	2.35	1.30	1.60
31	......	......	6.15	......	2.20	......	1.05	0.90	......	2.40	......	1.45

Note.— Gage readings discontinued January 8 to February 28; river frozen over.

Current-meter Discharge Measurements of Moose River at Moose River, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Ft. per second.*	*Second-feet.*
1910.						
May 12	W. G. Hoyt	2.51	218	768	1.12	862
July 11	J. J. Phelan	0.88	204	413	0.63	260

Mean Daily Discharge, Second-feet, of Moose River at Moose River, N. Y.

DAY.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.										
1	6,060	4,660	2,240	800	265	278	252	1,220	855	375
2	5,820	4,510	2,140	1,080	278	278	240	1,060	855	345
3	5,110	4,280	2,140	1,320	265	278	215	1,020	910	390
4	3,860	4,070	2,040	1,080	290	800	240	965	910	90
5	3,140	3,260	2,140	1,080	315	2,040	240	882	938	420
6	2,780	3,080	2,290	1,290	345	1,290	265	800	938	500
7	2,780	3,460	1,990	1,550	315	1,120	302	725	910	465
8	2,670	3,140	1,720	1,720	278	938	405	700	828	390
9	2,780	2,290	1,430	1,670	290	750	390	630	775	278
10	2,780	1,850	1,220	1,550	265	828	375	610	750	240
11	2,620	1,400	1,020	1,320	265	1,150	375	570	700	240
12	2,450	1,260	828	1,290	240	1,400	405	535	650	215
13	2,290	1,150	650	1,080	240	1,220	390	482	650	215
14	2,240	1,120	465	800	240	965	420	465	610	240
15	2,140	995	135	700	240	910	420	465	610	240
16	1,940	965	345	630	240	855	375	90	570	265
17	1,550	965	405	610	135	775	405	465	518	240
18	1,360	910	482	570	240	675	405	465	500	215
19	1,220	910	610	535	265	610	360	500	465	215
20	1,060	855	750	500	240	590	345	535	435	240
21	910	855	828	465	240	535	375	590	435	240
22	1,060	800	965	435	215	482	375	590	435	215
23	1,360	800	1,150	375	215	420	405	610	435	240
24	1,990	800	1,320	135	240	345	405	675	465	265
25	3,860	800	1,120	330	265	278	435	775	435	278
26	4,880	1,220	1,080	330	278	228	435	882	435	240
27	4,880	1,800	1,020	315	265	185	482	775	405	340
28	4,280	1,760	965	302	240	90	590	750	405	500
29	4,810	1,900	882	290	228	195	800	700	405	518
30	4,580	2,190	775	265	265	278	1,180	775	375	465
31	4,580	......	700	......	302	265	......	800	......	420
Mean	3,030	1,940	1,160	814	258	679	410	681	620	308

NOTE.—Ice conditions, January 1 to February 28. December may be somewhat in error, due to ice conditions. Daily discharges are based on a rating curve well defined between 240 and 3,650 second-feet.

Monthly Discharge of Moose River at Moose River, N. Y.

[Drainage area, 346 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
March	6,060	910	3,030	8.76	10.10
April	4,660	800	1,940	5.61	6.26
May	2,290	135	1,160	3.35	3.86
June	1,720	135	814	2.35	2.62
July	345	135	258	0.746	0.86
August	2,040	90	679	1.96	2.26
September	1,180	215	410	1.18	1.32
October	1,220	90	681	1.97	2.27
November	938	375	680	1.79	2.00
December	518	90	308	0.890	1.30

OSWEGO-ONEIDA-SENECA RIVER DRAINAGE BASIN.

DESCRIPTION OF BASIN.

Oswego river is formed by the union of Seneca and Oneida rivers at Three River Point about twelve miles northwest of Syracuse, N. Y., whence its course is northwestward to Oswego, where it enters Lake Ontario. The length of the river, from the junction to the mouth, is about 20.5 miles, and the drainage basin along this distance is a narrow strip of country, moderately rolling. Above the junction of Seneca and Oneida rivers the basin spreads out, attaining an extreme width east and west of about 100 miles and north and south of from seventy to eighty miles. There is, on the whole, a gradual rise from the low, level lands which border Lake Ontario to the north-south ridges which separate the various lakes south of Seneca river and which farther south become merged with the still more elevated country lying along the southern boundary of the Lake Ontario watershed.

The most remarkable feature of the drainage basin is the chain of lakes stretching across its southern border. From west to east the principal lakes are, in order, Canandaigua, Keuka, Seneca, Cayuga, Owasco, Skaneateles and Oneida. These seven lakes include a water-surface of, approximately, 280 square miles, increased by four smaller lakes — Cross, Onondaga, Otisco and Cazenovia — to about 295 square miles. The larger of the lakes, Oneida, Cayuga and Seneca, are used for steam-towing navigation, having connection with the Erie and Oswego canals. Cayuga and Seneca lakes are noted for their depth and for the abrupt slopes of their beds. The influence of the lakes on Oswego river is of the utmost importance in contributing to the steadiness of its flow.

A fall of 100 feet in the course of the main river is largely utilized by seven dams, which also partly canalize the stream. The intervening stretches are covered by the Oswego canal, which draws its water-supply from the river.

Drainage Areas Tributary to Oneida Lake and Oneida River. a

LOCALITY.	AREA IN SQUARE MILES.		
	Place to place.	Sub-total.	Total.
East branch, Fish creek.			
Head to junction with Alder creek	45.4		
Alder creek	25.7	71.1	
Junction with Alder creek to junction with Point Rock creek.	36.7	107.8	
Point Rock creek	19.9	127.7	
Junction with Point Rock creek to junction with Fall brook.	4.5	132.2	
Fall brook	13.5	145.7	
Junction with Fall brook to junction with Florence creek	1.3	147.0	
Florence creek	20.4	167.4	
Junction with Florence creek to junction with Furnace creek (Taberg)	1.7	169.1	
Furnace creek	14.4	183.5	
Taberg to junction with West branch, Fish creek	3.6	187.1	
West branch, Fish creek.			
Head to lower dam, Williamston	25.8	25.8	
Williamston to West Camden	27.1	52.9	
West Camden to junction with Mad river, Camden	14.2	67.1	
Mad river	45.4	112.5	
Camden to junction with Little river	21.6	134.1	
Little river	52.1	186.2	
Little river to McConnellsville	4.0	190.2	
McConnellsville to junction with East branch, Fish creek	11.9	202.1	
Junction of East and West branches, Fish creek, to junction with Wood creek	27.8	389.2	417.0
Wood creek.			
Above Erie canal, Rome	10.2	10.2	
Erie canal, Rome, to junction with Mud creek	2.0	12.2	
Mud creek	20.0	32.2	
Junction with Mud creek to junction with Canada creek	6.4	38.6	
Canada creek	31.0	69.6	
Junction with Canada creek to junction with Stoney creek.	1.2	70.8	
Stoney creek	20.4	91.2	
Junction with Stoney creek to junction with Fish creek	31.4	122.6	122.6
Oneida creek.			
Head to Peterboro	13.4	13.4	
Peterboro to falls	6.7	20.1	
Falls to Munnsville	15.6	35.7	
Munnsville to Kenwood	27.3	63.0	
Kenwood to Oneida Castle (State dam)	10.8	73.8	
Oneida Castle to Sconondoa creek, Oneida	2.1	75.9	
Sconondoa creek	34.3	110.2	
Sconondoa creek to Durhamville	4.8	115.0	
Durhamville to mouth	28.0	143.0	143.0
Canaseraga creek.			
Head of Perryville	5.7		
Perryville to Erie canal	9.0	14.7	
Erie canal to Douglas ditch	8.1	22.8	
Cowassalon creek.			
Head to Clockville creek	17.2	17.2	
Clockville creek	11.1	28.3	
Clockville creek to Erie canal	5.5	33.8	
Erie canal to mouth of Douglas ditch	39.3	73.1	
Junction with Douglas ditch to Lakeport	3.2	95.9	99.1
Chittenango creek.			
Erieville reservoir, water-surface	.45		
Erieville reservoir, land drainage	3.30	3.75	
Erieville reservoir to Cazenovia lake	30.5	34.25	
Cazenovia lake, water-surface	1.7	35.95	
Cazenovia lake, land drainage	8.7	44.65	
Cazenovia lake to Chittenango falls	14.4	59.05	
Chittenango falls to State dam, Chittenango	17.9	76.95	
State dam to junction with Butternut creek	28.1	105.05	
Butternut creek.			
Head of Jamesville reservoir	47.4	47.4	
Jamesville reservoir to State dam	5.7	53.1	
State dam to junction with Limestone creek	19.2	72.3	
Limestone creek.			
De Ruyter reservoir, water-surface	1.0		
De Ruyter reservoir, land drainage	17.8	18.8	
De Ruyter reservoir to junction with East branch	4.3	23.1	
East, or New Woodstock branch	12.6	35.7	

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a From U. S. Geological Survey topographic maps.

Drainage Areas Tributary to Oneida Lake and Oneida River — (Concluded).

LOCALITY.	AREA IN SQUARE MILES.		
	Place to place.	Sub-total.	Total.
Butternut creek (*Concluded*).			
Junction with East branch to junction with West branch	34.5	70.2	
West branch, Limestone creek, enters above State feeder dam	24.8	95.0	
State dam to junction with Butternut creek	18.2	113.2	185.5
Junction with Limestone creek to Chittenango creek	1.1	186.6	291.65
Chittenango creek, junction with Butternut creek to Bridgeport	30.3	321.95	
Chittenango creek, Bridgeport to Oneida lake	4.3	326.25	326.25
Oneida lake drainage through main streams	....	1,107.95	
Big Bay creek	26.3		
Little Bay creek	11.5		
Scriba creek	45.4		
Coast drainage, north shore Oneida lake	54.5		
Coast drainage, south shore Oneida lake	28.9	166.6	1,274.55
Water-surface, Oneida lake	78		
Land drainage, Oneida lake	1,274.55	1,352.55	
Oneida river.			
Brewerton to Caughdenoy creek	4.8	4.8	1,357.9
Caughdenoy creek	19.3	24.1	1,376.7
Caughdenoy creek to Oak Orchard	25.1	49.2	1,401.8
Mud creek	34.7	83.9	1,436.5
Oak Orchard to Potts creek	5.0	88.9	1,441.5
Potts creek	22.9	111.8	1,464.4
Six Mile creek	24.0	135.8	1,488.4
Potts creek to Three River Point	4.5	140.3	1,492.9

Drainage Areas Tributary to Seneca River. a

LOCALITY.	AREA IN SQUARE MILES.			
	Place to place.	Sub-total.	Branch total.	General total.
Mud creek.				
Head to and including Schaffer creek	51.31			
Junction with Schaffer creek to junction with Sucker brook, Victor (formerly Ganargua creek)	25.70	77.01		
Sucker brook	20.15	97.16		
Ganargua creek.				
Victor to Erie canal, Macedon	26.20	123.36		
Macedon to junction with East Red creek, East Palmyra	55.0	178.36		
East Red creek	59.5	237.86		
East Red creek to Canandaigua outlet	61.37	299.23	299.23	
Canandaigua lake.				
Naples creek	48.55	171.97		
West river	42.08			
Other land drainage	81.34			
Water-surface	16.40	....	188.37	
Canandaigua outlet.				
Foot of lake to and including Black brook	50.37	238.74		
Black brook to Flint creek, at Phelps	54.34	293.08	293.08	
Flint creek.				
Above Patten	31.59			
Patten to Gorham, not including Gorham swamp	24.84	56.43		
Gorham swamp	5.46	61.89		
Gorham to Orleans	25.57	87.46		
Orleans to junction with Canandaigua outlet at Phelps	15.21	102.67	395.75	
Phelps to junction with Ganargua creek at Lyons, forming Clyde river	48.36	444.11	743.34	

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a From U. S. Geological Survey topographic maps.

Drainage Areas Tributary to Seneca River — (Concluded.)

LOCALITY.	AREA IN SQUARE MILES.			
	Place to place.	Sub-total.	Branch total.	General total.
Clyde river.				
Lyons to junction with Seneca river, foot of Cayuga lake	141.11	884.45	....	884.45
Seneca river.				
Seneca lake.				
Keuka lake.				
Land drainage to outlet	160.96			
Water-surface	17.51	178.47		
Keuka outlet to Seneca lake	24.80	203.27	640.93	
Catharine creek.				
Above Montour Falls	66.46	....		
Montour Falls to Seneca lake	29.91	96.37		
Watkins Glen creek	23.53	23.53		
Direct lake drainage	317.76	317.76		
Water-surface	67.16	....	708.09	
Seneca river, foot of Seneca lake to Waterloo	40.90	....	748.99	
Seneca river, Waterloo to Seneca Falls	28.55	....	777.54	
Seneca river, Seneca Falls to Mud lock, foot of Cayuga Lake	7.52	....	785.06	
Cayuga lake.				
Cascadilla creek	14.38			
Six Mile creek	59.05			
Buttermilk creek	29.16			
Cayuga inlet	67.02			
Salmon creek	91.13			
Fall creek.				
Above Freeville	58.68			
Virgil creek	26.00	84.68		
Freeville to Cornell dam	30.62	115.20		
Cornell dam to Cayuga lake	1.56	116.76		
Taghanic creek.				
Above Halseyville	56.96			
Halseyville to Taghanic falls	10.40	67.36		
Taghanic falls to Cayuga lake	.39	67.75		
Other Cayuga lake drainage	275.04	720.29		
Cayuga lake, water-surface	66.31	786.60	1,571.60	
Seneca river, Cayuga lake, to junction with Clyde river	15.42	....	1,587.02	2,471.47
Seneca river, junction with Clyde river to junction with Owasco outlet	146.23	....	....	2,617.70
Owasco lake.				
Owasco inlet, above Moravia	74.33			
Moravia to Owasco lake	42.92	117.25		
Direct drainage to lake	76.24	193.49		
Foot of lake to State dam	.98	194.47		
Water-surface	10.40	204.87		
Owasco outlet to junction with Seneca river	16.73	221.66	....	2,839.30
Seneca river, junction with Owasco outlet to junction with Skaneateles outlet	98.70	....	....	2,938.00
Skaneateles lake.				
Land drainage to foot	58.41			
Water-surface	14.13	72.54		
Foot of lake to Willow Glen	1.84	74.38		
Willow Glen to Seneca river	16.69	91.07	....	3,029.07
Seneca river, Skaneateles outlet to Carpenter brook	25.50	....	....	3,054.57
Carpenter brook	18.70	....	....	3,073.27
Carpenter brook to Baldwinsville	48.10	....	....	3,121.37
Baldwinsville to Onondaga outlet	17.80	....	....	3,139.17
Onondaga lake.				
Otisco lake, land drainage to foot	41.40			
Otisco lake, water-surface	3.30	44.70		
Nine Mile creek (Otisco outlet) to Onondaga lake	74.0	118.70		
Onondaga creek.				
Above junction with West brook	40.6			
Junction with West brook to inflow to Onondaga lake	65.3	105.9		
Other land drainage to Onondaga lake	59.1	283.7		
Onondaga lake, water-surface	4.7	288.4		
Onondaga lake, outlet to Seneca river	3.0	291.4	....	3,430.57
Seneca river, Onondaga outlet to Belgium	10.12	....	....	3,440.69
Seneca river, Belgium to Three River Pt	4.4	....	....	3,445.09

Drainage Areas Tributary to Oswego River. a

LOCALITY.	AREA IN SQUARE MILES.		
	Place to place.	Total from Three River Point.	Total drainage basin.
Oneida river, above Three River Point	....	....	1,493
Seneca river, above Three River Point	....	....	3,445
Oswego river at Three River Point	....	....	4,938
Three River Point to Phoenix	2.32	2.32	4,940.32
Phoenix to Hinmansville	17.58	19.90	4,957.90
Hinmansville to Ox creek	17.05	37.15	4,975.15
Ox creek	33.68	70.83	5,008.83
Ox creek to upper dam, Fulton	9.15	79.98	5,016.98
Fulton to Neatawanta creek	9.15	89.13	5,027.13
Neatawanta creek	21.92	111.05	5,049.05
Neatawanta creek to Black creek	1.01	112.06	5,050.06
Black creek	37.93	149.99	5,087.99
Black creek to Battle Island	.92	150.91	5,088.91
Battle Island to Minetto	2.11	153.02	5,091.02
Minetto to High dam	4.87	157.89	5,095.89
High dam to Oswego dam	1.22	159.11	5,097.11
Oswego dam to Lake Ontario	1.21	160.32	5,098.32

a From U. S. Geological Survey topographic maps.

OSWEGO RIVER.

The drainage area tributary to Oswego river is 160 square miles. This area comprises chiefly moderately-rolling, cultivated upland, having a good depth of soil overlying the rock, which as a rule, is visible only in the bed of the stream. A portion of the area is drained through lakes and marshes. The run-off from the direct drainage to Oswego river is moderate and the regimen differs but little from that resulting from the inflow of the two main tributaries — the Oneida and Seneca.

OSWEGO RIVER WATER-SURFACE ELEVATION RECORDS.

In the following series of tables there are given records of the mean daily elevation of water-surface of the Oswego river at different gaging stations during the year 1910. The elevations are uniformly referred to the Barge canal datum, which is equivalent to mean tide at New York, taken to be as elevation 14.73 below the old grist mill bench-mark at Greenbush (Rensselaer).

The tables of elevation of water-surface are arranged in order, proceeding up-stream from the curved dam at Oswego through to Three River Point.

The accompanying table gives details as to the types of gages used, the datum of each and the manner in which they are read.

Water-surface Elevation Gages Maintained on Oswego River During the Year 1910.

LOCATION.	Date established.	Observer.	Elevation of zero mark (B. C. datum).	Type of gage.	Subdivision of gage.	Readings taken to	USUAL TIME OF READING.	
							A. M.	P. M.
Above curved dam, Oswego	April 7, 1904	D. D. Tompkins	264.23	Staff	$\frac{1}{10}$ Foot	$\frac{1}{10}$ Foot	8	....
Below High dam, Oswego	April 7, 1904	Arthur C. Owens	266.07	"	"	"	8	....
Above High dam, Oswego	April 7, 1904	" "	280.37	"	"	"	8	....
Below dam, Minetto	April 18, 1904	Roy L. Smith to July 23, 1910	286.61	Chain	"	"	7	....
Above dam, Minetto	April 18, 1904	W. W. Perry after July 23, 1910	295.18	"	"	"	7	....
Opposite Battle Island, Fulton	Sept. 14, 1900	L. D. Sterling	294.53	Staff	"	$\frac{1}{100}$ "	....	P. M.
Below Battle Island dam, Fulton	April 8, 1904	Smith Sharp	301.00	Chain	"	$\frac{1}{10}$ "	9	....
Above Battle Island dam, Fulton	April 11, 1904	" "	304.98	Staff	"	"	9	....
Mouth of Waterhouse creek, Fulton	April 9, 1904	Barge canal office employe	315.00	Ref. point	....	$\frac{5}{100}$ "	11	....
L. H. & P. Co.'s tail-race, Fulton	April 17, 1908	" " "	....	" "	....	" "	8:30	4
L. H. & P. Co.'s head-gates, Fulton.	" " "	" " "	337.50	" "	....	" "	8:30	4
L. H. & P. Co.'s head-gates, Fulton.	" " "	" " "	342.50	" "	....	" "	8:30	4
L. H. & P. Co.'s head-gates, Fulton.	" " "	" " "	335.90	" "	....	" "	10	....
Above Upper Dam, Fulton	April 9, 1904	" " "	362.40	" "	....	" "	9	....
Mouth of Ox creek, Fulton	April 12, 1904	B. M. Wilcox	347.71	Staff	$\frac{1}{10}$ Foot	$\frac{1}{10}$ Foot	11	....
Below site of Horseshoe dam, Phoenix	April 13, 1904	Frank M. Hughes	346.64	Chain	"	"	....	1:30
Above site of Horseshoe dam, Phoenix	April 13, 1904	" " "	347.00	"	"	"	....	1:30
Hinmansville bridge, Phoenix	April 13, 1904	" " "	348.64	"	"	"	....	1
Below dam, Phoenix	April 16, 1904	Geo. Archambo	352.95	Staff	"	"	12	....
Above dam, Phoenix	April 16, 1904	" "	357.29	"	"	"	12	....

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River above Curved Dam, Oswego, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	267.73	268.13	268.63	269.13	268.43	267.93	266.93	266.23	267.33	267.83	267.83	268.73
2......	267.73	268.13	269.23	269.13	268.63	267.83	266.83	266.63	267.33	268.03	267.73	268.83
3......	267.03	268.03	269.83	269.33	268.53	267.73	266.83	267.23	267.23	266.73	267.43	268.83
4......	267.03	268.03	270.03	269.13	268.63	267.73	267.13	267.53	268.03	267.73	267.73	269.03
5......	267.53	268.03	270.23	269.03	268.53	268.13	266.63	267.33	267.83	267.73	267.73	269.13
6......	267.03	268.33	270.43	268.93	268.53	268.23	267.73	267.23	267.93	267.43	268.23	269.13
7......	267.03	268.03	270.73	268.73	268.53	267.93	267.63	267.23	267.93	267.73	268.13	268.53
8......	267.03	267.93	270.73	268.73	268.73	267.93	267.03	267.63	267.93	267.83	268.13	268.53
9......	267.83	267.73	270.73	268.93	268.53	267.93	267.33	267.23	267.73	268.03	268.13	268.53
10......	266.03	267.73	270.73	268.73	268.43	267.93	267.53	267.53	267.63	268.43	268.23	268.43
11......	266.73	267.93	270.73	268.53	268.43	267.93	267.13	267.43	268.13	268.43	268.33	268.63
12......	266.73	268.23	270.63	268.43	268.23	268.23	267.03	267.23	268.03	268.43	268.23	268.23
13......	266.63	268.23	270.83	268.33	268.13	267.93	267.03	267.23	267.73	268.23	268.73	268.23
14......	266.63	268.13	270.53	268.33	268.03	267.83	267.33	267.33	267.73	267.83	268.93	268.23
15......	266.63	267.73	270.43	268.33	268.23	267.73	267.33	267.03	267.73	267.73	268.73	268.13
16......	267.63	267.73	270.23	268.33	268.03	267.63	267.63	267.53	267.73	267.93	268.63	268.13
17......	265.63	267.63	270.23	268.63	268.03	267.53	267.63	267.53	267.63	267.73	268.63	268.13
18......	266.43	267.63	270.03	268.43	268.03	267.53	267.23	267.33	267.83	267.73	268.63	268.53
19......	266.23	267.63	269.83	268.33	267.93	267.73	267.53	267.33	267.33	267.73	268.63	268.53
20......	266.23	268.43	270.23	268.23	268.03	267.63	267.33	267.23	267.53	267.53	268.93	268.13
21......	266.43	267.73	269.73	268.13	268.03	267.63	267.53	267.73	267.53	267.53	268.63	268.13
22......	266.93	267.73	269.73	268.03	268.23	267.23	267.83	267.23	267.53	267.73	268.73	268.13
23......	268.23	267.73	269.63	268.03	268.13	267.23	267.63	267.43	266.93	268.23	268.63	267.23
24......	267.93	267.93	269.53	268.23	268.03	267.13	267.73	267.43	267.53	267.63	268.63	267.93
25......	267.93	267.93	269.53	268.13	268.13	267.13	267.23	267.23	267.93	267.73	268.73	268.13
26......	268.13	267.83	269.33	268.13	268.03	267.03	267.53	267.53	267.23	267.63	268.73	268.13
27......	268.13	267.93	269.73	268.03	268.03	267.03	266.93	267.43	267.23	267.53	269.03	268.03
28......	268.13	268.23	269.43	268.03	268.03	267.03	267.33	268.03	267.23	267.43	268.83	268.03
29......	268.63	......	269.43	268.13	268.23	266.93	266.93	267.53	267.83	267.63	268.83	268.13
30......	268.63	......	269.23	268.23	268.33	266.93	267.43	267.23	267.73	268.13	268.73	268.13
31......	268.13	......	269.23	......	268.03	......	267.93	267.23	......	267.93	......	268.13

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River below High Dam, near Oswego, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	268.37	269.27	270.47	270.27	269.27	268.87	267.77	266.87	267.87	268.17	268.37	269.37
2......	268.57	269.27	271.37	270.27	269.47	268.87	267.77	268.07	267.77	268.47	268.27	269.47
3......	267.17	269.17	272.27	270.07	269.47	268.87	267.57	267.97	267.57	268.17	268.07	269.37
4......	268.47	269.07	272.87	270.17	269.57	268.77	267.67	267.87	268.37	268.27	268.27	269.37
5......	268.77	269.17	272.47	270.07	269.47	268.67	267.47	267.57	268.07	268.17	268.37	269.37
6......	268.37	268.97	272.27	270.07	269.47	269.07	268.27	267.47	268.37	267.77	268.57	269.37
7......	268.27	268.87	272.07	269.97	269.37	268.97	268.27	267.97	268.47	268.17	268.57	269.27
8......	268.17	269.07	272.07	269.87	269.37	269.07	267.67	267.87	268.27	268.27	268.57	269.27
9......	268.57	268.97	272.07	269.77	269.37	268.97	267.97	267.77	268.27	268.47	268.67	269.07
10......	267.57	269.07	272.07	269.57	269.37	268.97	268.37	267.97	268.17	268.67	268.77	269.07
11......	268.07	269.07	272.07	269.57	269.27	268.97	267.67	267.57	268.67	268.77	268.97	269.07
12......	267.87	268.97	272.07	269.57	269.07	268.97	267.67	267.67	268.37	268.57	268.97	269.17
13......	267.77	269.17	271.97	269.47	269.07	268.87	268.07	267.67	268.27	268.47	269.17	269.07
14......	267.97	269.07	272.07	269.37	268.97	268.87	267.97	268.37	267.97	268.27	269.17	269.07
15......	268.17	269.07	271.87	269.37	268.87	268.77	267.87	267.57	268.07	268.17	269.17	268.97
16......	268.07	268.97	271.77	269.27	268.97	268.67	268.17	268.07	268.17	268.37	269.17	268.47
17......	266.97	269.07	271.67	269.17	268.87	268.57	268.37	268.27	268.07	268.17	269.27	268.97
18......	267.77	268.97	271.37	269.37	268.87	268.57	267.87	267.87	268.47	267.97	269.27	268.97
19......	267.67	269.07	271.17	269.37	268.77	268.47	268.17	267.77	267.97	268.17	269.27	269.07
20......	267.77	269.17	271.17	269.27	268.87	268.47	267.87	267.67	267.97	267.77	269.27	269.27
21......	267.77	269.07	271.07	269.17	268.87	268.47	267.77	268.47	268.07	267.97	269.17	268.97
22......	268.07	269.17	271.07	269.07	268.77	268.37	268.27	267.77	268.07	268.17	269.27	268.77
23......	269.17	269.07	270.97	268.97	268.97	268.27	268.17	267.97	267.37	268.67	269.27	268.17
24......	268.97	269.17	270.87	268.87	268.97	268.17	268.27	267.97	268.17	268.07	269.57	268.97
25......	269.27	269.27	270.87	269.17	269.07	268.17	267.67	267.87	268.47	268.07	269.27	268.77
26......	269.27	269.17	270.77	269.07	269.07	268.07	268.17	268.00	267.47	268.17	269.37	268.97
27......	269.47	268.97	270.57	269.07	269.07	267.97	267.67	267.97	267.67	268.07	269.47	269.07
28......	269.37	269.47	270.57	269.07	268.97	267.97	268.07	268.47	267.97	267.97	269.47	268.97
29......	269.37	......	270.47	269.17	268.97	267.87	267.27	267.57	268.07	268.17	269.47	269.07
30......	269.27	......	270.47	269.17	269.17	267.87	267.97	267.57	268.17	268.47	269.37	269.17
31......	269.47	......	270.47	......	268.97	......	268.27	267.77	......	268.47	......	269.07

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River above High Dam near Oswego, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	282.87	284.07	285.07	285.97	284.67	284.47	283.27	282.07	282.57	282.87	283.07	283.97
2	282.77	283.97	285.97	285.97	285.07	284.47	283.27	282.47	282.47	282.57	283.07	284.07
3	282.47	283.97	286.57	285.67	284.97	284.37	282.97	282.47	282.57	282.37	282.97	284.07
4	282.57	283.87	286.77	285.87	285.07	284.27	283.07	282.37	282.37	282.77	283.07	283.77
5	282.77	283.87	286.97	285.77	285.07	284.07	283.07	282.27	282.37	282.77	283.07	284.07
6	282.97	283.67	286.87	285.67	284.97	284.57	283.07	282.37	282.57	282.67	282.97	283.97
7	282.87	283.77	287.57	285.57	284.87	284.57	283.07	282.17	282.77	282.77	283.17	283.87
8	282.87	283.77	287.57	285.47	284.67	284.57	282.87	282.07	282.77	282.87	283.17	283.77
9	282.87	283.77	287.67	285.37	284.97	284.57	282.87	282.47	282.87	282.57	283.37	283.57
10	282.47	283.77	287.67	285.07	284.87	284.57	282.57	282.47	282.87	282.77	283.37	283.57
11	282.97	283.67	287.67	285.17	284.77	284.47	282.67	282.37	282.67	282.97	283.47	283.27
12	282.87	283.77	287.57	285.17	284.57	284.27	282.77	282.37	282.87	282.87	283.57	283.57
13	282.97	283.67	287.37	285.17	284.47	284.47	282.77	282.47	282.87	282.87	283.47	283.57
14	282.97	283.77	287.47	285.07	284.37	284.37	282.77	282.47	282.77	282.87	283.87	283.57
15	283.07	283.87	287.37	284.97	284.17	284.27	282.77	282.37	282.87	282.87	283.87	283.57
16	282.97	283.87	287.27	284.97	284.27	284.17	282.87	282.47	282.87	282.67	283.87	283.07
17	282.47	283.87	287.07	284.77	284.37	284.07	282.47	282.47	282.87	282.87	283.97	283.37
18	283.07	283.87	287.07	285.07	284.27	284.07	282.57	282.37	282.67	282.87	283.97	283.17
19	283.07	283.97	287.87	284.97	284.17	283.67	282.77	282.57	282.67	282.97	283.87	283.57
20	283.07	283.87	286.57	284.87	284.27	283.87	282.67	282.47	282.67	282.87	283.57	283.57
21	283.17	283.87	286.67	284.77	284.27	283.87	282.47	282.57	282.77	282.87	283.97	283.37
22	283.27	283.97	286.62	284.67	284.07	283.77	282.67	282.47	282.77	282.87	283.87	283.37
23	283.67	283.97	286.52	284.67	284.37	283.67	282.67	282.67	282.57	282.67	283.87	283.07
24	283.67	283.87	286.42	284.37	284.37	283.67	282.37	282.57	282.77	282.77	283.97	283.57
25	283.87	283.97	286.37	284.77	284.57	283.57	282.47	282.47	282.57	282.97	283.87	283.57
26	283.87	284.07	286.27	284.77	284.57	283.27	282.67	282.47	282.47	282.87	284.07	283.47
27	284.07	283.57	286.07	284.67	284.57	283.37	282.37	282.57	282.57	282.97	283.87	283.47
28	284.17	284.17	286.32	284.67	284.57	283.47	282.47	282.67	282.67	282.97	284.07	283.57
29	284.17	......	286.17	284.77	284.37	283.37	282.37	282.27	282.67	282.87	284.07	283.57
30	284.07	......	286.12	284.87	284.57	283.37	282.47	282.47	282.87	282.77	284.07	283.67
31	284.17	......	286.07	......	284.57	......	282.17	282.57	......	283.07	......	283.47

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River below Dam a Minetto, N. Y.

DAY.	Jan.*a*	Feb.*a*	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	......	......	*a*	293 51	292.21	292.01	290.51	289.61	289.64	289.84	290.24	291.34
2	......	......	293.41	293.41	292.41	292.01	290.41	290.01	289.64	289.64	290.24	291.34
3	......	......	294.21	293.11	292.41	292.01	290.31	289.61	289.64	289.44	290.14	291.24
4	......	......	294.51	293.21	292.41	292.11	290.31	289.71	289.74	290.04	290.14	291.24
5	......	......	294.81	293.11	292.31	292.11	290.41	289.61	289.84	289.74	290.24	291.14
6	......	......	294.61	293.01	292.31	292.21	290.41	289.61	289.74	289.74	290.34	291.14
7	......	......	295.21	292.91	292.31	292.11	290.41	289.31	289.84	289.94	290.44	291.04
8	......	......	*a*	292.81	292.21	292.01	290.31	289.51	289.94	289.94	290.54	291.04
9	......	......	295.41	292.71	292.21	292.01	290.31	289.61	290.04	289.94	290.54	290.94
10	......	......	295.61	292.51	292.11	291.91	290.11	289.61	290.04	289.94	290.64	290.94
11	......	......	295.61	292.51	292.01	291.91	290.31	289.61	290.04	290.04	290.84	290.84
12	......	......	295.41	292.51	291.91	291.81	290.31	289.71	290.14	290.04	291.04	290.74
13	......	......	295.41	292.51	291.91	291.91	290.21	289.81	290.14	290.04	291.14	290.74
14	......	......	*a*	292.51	291.81	291.81	290.11	289.71	290.04	290.04	291.14	290.74
15	......	......	*a*	292.41	291.71	291.71	290.11	289.81	290.04	290.04	291.34	290.74
16	......	......	295.01	292.31	291.81	291.61	290.01	289.71	290.04	290.04	291.14	290.74
17	......	......	294.81	292.11	291.71	291.51	289.81	289.91	290.04	290.04	291.14	290.74
18	......	......	*a*	292.31	291.81	291.41	290.01	290.01	289.94	290.04	291.14	290.74
19	......	......	*a*	292.31	291.81	291.21	*a*	289.91	289.84	290.14	291.14	290.64
20	......	......	294.31	292.21	291.81	291.21	*a*	289.91	289.94	290.04	291.24	290.54
21	......	......	294.21	292.11	291.81	291.11	*a*	289.81	289.84	289.74	291.24	290.54
22	......	......	294.21	292.01	291.71	291.01	*a*	289.91	289.84	289.94	291.14	290.61
23	......	......	294.11	292.01	291.81	290.91	290.21	290.01	289.84	289.94	291.14	290.61
24	......	......	294.01	291.81	291.81	290.81	289.21	289.91	289.94	289.94	291.14	290.61
25	......	......	294.01	292.01	291.91	290.81	290.91	289.81	289.74	289.94	291.24	290.61
26	......	......	293.91	292.01	291.91	290.71	290.11	289.81	289.64	290.04	291.24	290.71
27	......	......	293.81	292.01	292.01	290.81	289.81	289.81	289.74	290.04	291.34	290.71
28	......	......	293.71	292.11	292.11	290.71	289.71	289.61	289.74	290.14	291.34	290.71
29	......	......	293.71	292.11	291.91	290.71	289.21	289.71	289.84	290.14	291.34	290.81
30	......	......	293.71	292.21	292.01	290.61	290.11	289.71	289.94	290.14	291.34	290.81
31	......	......	293.61	......	292.01	......	289.71	289.81	......	290.24	......	290.81

a No record.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River above Dam at Minetto, N. Y.

DAY.	Jan.*a*	Feb.*a*	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	......	......	*a*	301.08	300.18	299.98	298.88	299.78	299.88	299.58	299.98	300.78
2	......	......	302.08	301.08	300.38	299.98	298.88	299.98	299.88	299.48	299.98	300.78
3	......	......	302.28	300.88	300.38	299.98	298.78	299.78	299.88	299.28	299.88	300.68
4	......	......	302.28	300.78	300.38	300.08	298.78	299.68	299.98	299.88	299.88	300.68
5	......	......	302.38	300.78	300.28	300.08	298.88	299.78	299.98	299.68	299.88	300.58
6	......	......	302.38	300.68	300.28	300.18	298.78	299.68	299.88	299.58	299.98	300.58
7	......	......	302.38	300.68	300.38	300.18	298.68	300.08	299.98	299.78	300.08	300.48
8	......	......	*a*	300.58	300.28	300.08	298.58	299.68	299.88	299.68	300.18	300.48
9	......	......	302.38	300.48	300.18	300.08	298.58	299.78	299.88	299.78	300.18	300.38
10	......	......	302.38	300.38	300.18	299.98	298.38	299.78	299.88	299.78	300.28	300.38
11	......	......	302.48	300.38	300.08	299.98	298.58	299.78	299.98	299.78	300.38	300.28
12	......	......	302.38	300.48	299.98	299.88	298.48	299.78	299.98	299.78	300.48	300.18
13	......	......	302.28	300.38	299.98	299.98	298.48	299.88	299.98	299.78	300.58	300.18
14	......	......	*a*	300.38	299.98	299.88	298.38	299.78	299.78	299.68	300.58	300.18
15	......	......	*a*	300.38	299.78	299.88	298.38	299.78	299.78	299.68	300.78	300.18
16	......	......	302.08	300.28	299.88	299.78	298.38	299.78	299.78	299.68	300.58	300.18
17	......	......	301.88	300.08	299.78	299.68	298.18	299.88	299.78	299.68	300.58	300.18
18	......	......	*a*	300.28	299.98	299.58	298.38	299.88	299.68	299.78	300.58	300.18
19	......	......	*a*	300.28	299.98	299.48	*a*	299.88	299.58	299.78	300.58	300.08
20	......	......	301.58	300.18	300.08	299.58	*a*	299.88	299.78	299.78	300.68	299.98
21	......	......	301.68	300.18	300.08	299.48	*a*	299.78	299.68	299.58	300.68	299.88
22	......	......	301.58	300.08	299.88	299.38	*a*	299.78	299.68	299.78	300.58	*a*
23	......	......	301.48	299.98	299.98	299.28	298.58	299.88	299.68	299.68	300.58	299.88
24	......	......	301.38	299.88	299.98	299.18	299.58	299.78	299.78	299.68	300.58	299.88
25	......	......	301.38	300.08	300.08	299.18	298.88	299.78	299.58	299.68	300.68	299.88
26	......	......	301.28	300.08	300.08	299.08	299.98	299.78	299.48	299.78	300.68	299.98
27	......	......	301.28	300.08	300.08	299.18	299.88	299.78	299.58	299.88	300.78	299.98
28	......	......	301.28	300.08	300.08	299.08	299.88	299.68	299.58	299.88	300.78	299.98
29	......	......	301.18	300.08	299.98	298.98	300.08	299.68	299.68	299.88	300.78	300.08
30	......	......	301.18	300.08	300.08	298.98	300.08	299.68	299.78	299.88	300.78	300.08
31	......	......	301.18	......	299.98	......	299.78	299.88	......	299.98	......	300.08

a No record.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River opposite Battle Island.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	301.58	302.83	304.13	305.08	303.23	302.68	300.76	301.03	301.03	300.93	301.03	302.63
2	301.13	302.95	304.35	305.03	302.83	303.03	300.73	300.68	300.95	300.14	301.08	302.65
3	301.35	303.08	304.83	304.63	302.73	302.56	300.33	301.04	300.93	300.83	301.10	302.63
4	301.36	302.95	305.53	304.73	303.68	302.44	300.83	301.03	300.53	300.76	301.12	302.43
5	301.73	302.93	306.34	304.63	303.53	302.33	300.68	300.93	301.13	300.73	301.12	302.73
6	301.83	302.73	306.73	304.33	303.38	302.96	300.66	300.93	301.14	300.83	300.23	302.63
7	301.83	303.18	306.83	304.34	303.16	303.15	299.74	300.13	301.13	300.85	301.25	302.43
8	301.53	302.73	306.93	304.15	303.13	302.98	300.08	300.93	301.15	300.83	301.34	302.33
9	301.23	302.78	307.08	304.08	303.17	302.93	300.04	300.93	301.23	299.93	301.43	302.25
10	301.33	302.63	306.44	304.35	302.93	302.88	299.83	300.93	301.24	300.94	301.53	302.13
11	301.33	301.74	306.35	304.37	302.73	302.83	300.05	301.04	300.73	300.73	301.63	301.73
12	301.38	301.76	306.43	303.53	302.85	302.35	299.84	301.06	301.33	300.76	301.63	302.08
13	301.03	301.58	306.23	303.58	302.74	303.03	300.08	300.95	301.13	300.73	301.33	302.15
14	301.06	301.73	306.33	303.58	302.73	302.66	300.05	300.23	301.14	300.77	301.63	302.37
15	300.98	301.96	306.14	303.43	304.45	302.43	300.03	300.93	301.13	300.73	301.74	302.37
16	300.93	302.08	306.13	303.33	302.53	302.28	300.03	300.84	300.98	300.14	301.79	302.37
17	301.13	302.35	306.05	303.25	302.43	302.08	299.58	300.83	300.93	300.96	302.21	302.38
18	301.23	302.53	306.03	303.34	302.08	302.04	300.15	301.23	300.13	300.73	302.28	302.38
19	301.08	302.53	305.83	303.33	302.13	301.63	299.96	301.27	301.04	300.63	302.28	302.42
20	300.85	302.43	305.53	303.15	302.08	302.13	299.93	301.13	300.83	300.65	302.13	302.33
21	301.13	302.68	305.77	303.08	302.09	301.73	299.96	300.33	300.85	300.63	302.53	302.17
22	301.28	302.63	305.88	302.93	301.58	301.38	299.93	301.23	300.87	300.63	302.66	302.08
23	302.13	302.48	305.93	302.83	302.53	301.23	299.93	301.03	300.73	300.23	302.68	301.95
24	302.48	302.33	305.85	303.03	302.43	301.25	299.73	300.93	300.83	300.84	302.73	301.73
25	302.48	302.53	305.83	302.94	302.63	301.23	300.33	300.95	300.08	300.76	302.76	301.63
26	302.45	303.08	305.84	302.93	302.65	300.73	300.63	301.00	300.34	300.63	302.53	302.45
27	302.73	303.73	305.43	302.93	302.98	301.23	300.93	300.98	300.33	300.63	302.15	302.63
28	302.78	303.98	305.28	302.98	302.96	301.04	300.84	300.13	299.93	300.77	302.74	302.76
29	302.73	......	305.23	303.23	302.93	300.85	300.83	301.34	300.63	300.93	302.63	302.95
30	302.83	......	305.17	303.23	303.18	300.83	300.73	301.15	300.93	300.06	302.63	303.17
31	302.95	......	305.13	......	302.83	......	300.08	301.13	......	300.94	......	303.13

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River below Battle Island Dam, near Fulton, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	303.30	304.00	305.15	305.55	304.20	304.30	303.70	303.60	303.50	303.40	303.70	304.15
2.....	303.15	304.00	306.50	305.50	304.80	304.25	303.70	303.65	303.40	302.35	303.65	304.00
3.....	303.15	303.85	307.30	305.05	304.60	304.25	303.40	303.40	303.40	303.45	303.60	304.30
4.....	303.10	303.80	307.60	305.50	304.50	304.15	303.60	303.15	302.80	303.45	303.60	304.00
5.....	303.20	303.80	307.40	305.35	304.55	304.00	303.65	303.05	303.70	303.20	303.65	304.05
6.....	303.20	303.70	307.15	305.10	304.50	304.55	303.60	302.55	303.50	303.20	303.35	304.05
7.....	303.25	303.90	308.10	305.00	304.50	304.45	303.60	302.60	303.45	303.30	303.50	304.15
8.....	303.25	303.80	308.25	304.95	304.40	304.40	303.60	303.65	303.60	303.40	303.70	304.15
9.....	303.00	303.80	308.25	304.85	304.50	304.40	303.40	303.10	303.70	302.90	303.80	304.10
10.....	303.05	303.85	308.25	304.50	304.55	304.40	303.20	303.15	303.60	303.80	303.80	304.00
11.....	303.00	303.70	308.25	304.70	304.40	304.40	303.25	303.00	303.00	303.60	303.80	303.60
12.....	303.10	303.60	308.25	304.60	304.30	304.10	303.20	303.10	304.00	303.45	303.95	303.70
13.....	303.10	303.45	307.80	304.60	304.30	304.30	303.30	303.50	303.70	303.40	303.30	303.80
14.....	303.10	303.60	307.90	304.50	304.25	304.20	303.30	302.90	303.60	303.50	303.80	303.80
15.....	303.10	303.70	307.80	304.50	303.90	304.20	303.30	303.80	303.50	303.50	304.10	303.85
16.....	303.10	303.75	307.60	304.50	304.40	304.15	303.30	303.50	303.55	302.85	304.10	303.90
17.....	303.00	303.70	307.30	304.30	304.15	304.00	302.95	303.30	303.65	303.50	304.00	303.90
18.....	303.15	303.80	307.00	304.60	304.20	303.90	303.80	303.45	302.95	303.30	304.05	303.50
19.....	303.15	303.80	306.80	304.55	304.10	303.85	303.60	303.40	303.60	303.45	304.10	303.55
20.....	303.20	303.65	306.45	304.55	304.20	304.20	303.45	303.40	303.65	303.40	303.60	303.60
21.....	303.35	304.00	306.65	304.55	304.10	304.00	302.85	302.90	303.50	303.40	304.10	303.60
22.....	303.50	303.95	306.50	304.30	304.00	303.95	303.20	303.50	303.45	303.65	304.05	303.65
23.....	303.65	303.80	306.30	304.25	304.40	303.95	303.15	303.50	303.50	302.90	304.10	303.70
24.....	303.80	303.85	306.20	304.15	304.15	303.85	303.10	303.50	303.60	303.40	304.10	303.80
25.....	303.90	303.70	306.10	304.50	304.30	303.75	303.60	303.50	302.80	303.50	304.15	303.50
26.....	303.90	303.70	305.85	304.40	304.25	303.50	303.00	303.50	303.70	303.40	304.10	303.70
27.....	304.00	303.80	305.65	304.35	304.35	303.95	302.45	303.45	303.50	303.40	303.90	304.10
28.....	304.05	304.75	306.00	304.30	304.50	303.95	303.55	302.90	303.45	303.45	304.30	304.25
29.....	304.05	......	305.80	304.40	304.20	303.95	303.10	303.60	303.60	303.40	304.20	304.05
30.....	303.95	......	305.80	304.45	304.50	303.75	303.70	303.50	303.55	303.00	304.25	304.40
31.....	304.05	......	305.65	......	304.50	......	302.30	303.50	......	303.90	......	304.00

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River above Battle Island Dam, near Fulton, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	309.18	310.03	310.78	311.38	310.38	310.38	309.58	309.58	309.28	309.23	309.58	310.28
2.....	309.18	309.98	311.28	311.28	310.88	310.38	309.58	309.38	309.18	308.78	309.48	310.33
3.....	309.18	310.03	311.68	311.13	310.68	310.38	309.43	309.33	309.18	309.48	309.48	310.18
4.....	309.13	309.98	311.98	311.33	310.78	310.23	309.68	309.08	308.98	309.33	309.58	310.08
5.....	309.18	309.98	312.08	311.28	310.78	310.18	309.68	308.98	309.28	309.08	309.63	309.98
6.....	309.28	309.88	312.08	311.13	310.68	310.78	309.48	308.78	309.08	309.18	309.18	310.03
7.....	309.28	309.98	312.58	311.03	310.63	310.43	309.48	308.78	309.23	309.08	309.48	309.93
8.....	309.28	309.83	312.68	310.93	310.28	310.48	309.38	309.38	309.48	309.23	309.68	309.88
9.....	309.13	309.78	312.68	310.83	310.68	310.48	309.28	308.98	309.28	308.88	309.78	309.58
10.....	309.23	309.83	312.68	310.68	310.68	310.48	309.18	309.08	309.33	309.58	309.78	309.78
11.....	309.18	309.88	312.68	310.78	310.68	310.48	309.18	308.98	308.98	309.48	309.78	309.58
12.....	309.23	309.83	312.68	310.83	310.48	310.18	309.23	308.88	309.58	309.38	309.88	309.48
13.....	309.18	309.58	312.08	310.78	310.48	310.38	309.28	308.98	309.48	309.38	308.98	309.53
14.....	309.18	309.88	312.63	310.63	310.38	310.18	309.28	308.88	309.38	309.38	309.48	309.48
15.....	309.18	309.83	312.38	310.58	310.13	310.18	309.28	309.58	309.38	309.38	309.98	309.28
16.....	309.23	309.78	312.38	310.58	310.43	310.18	309.28	309.48	309.38	308.93	309.93	309.33
17.....	309.18	309.78	312.18	310.38	310.43	310.08	308.98	309.38	309.38	309.48	309.98	309.38
18.....	309.28	309.83	312.08	310.68	310.18	309.98	309.48	309.28	308.98	309.28	310.08	309.38
19.....	309.28	309.78	312.03	310.68	310.18	309.88	309.38	309.18	309.68	309.28	310.08	309.28
20.....	309.28	309.68	311.83	310.68	310.18	310.18	309.28	309.18	309.48	309.28	309.68	309.33
21.....	309.33	309.93	311.98	310.58	310.18	310.08	308.88	307.98	309.38	309.28	310.03	309.38
22.....	309.58	309.88	311.88	310.58	309.98	309.98	309.18	309.13	309.28	309.38	309.98	309.43
23.....	309.68	309.88	311.78	310.48	309.38	309.88	309.28	309.13	309.33	308.98	309.98	309.48
24.....	309.93	309.93	311.78	310.18	310.23	309.88	308.88	309.18	309.38	309.38	309.98	309.58
25.....	309.98	309.98	311.78	310.48	310.28	309.78	309.28	309.18	308.88	309.48	310.03	309.38
26.....	309.98	309.98	311.78	310.48	310.38	309.48	309.23	309.18	309.58	309.43	309.98	309.48
27.....	310.03	309.78	311.43	310.48	310.48	309.88	307.98	309.28	309.38	309.38	309.78	309.68
28.....	310.08	310.13	311.58	310.43	310.48	309.83	309.38	308.98	309.28	309.38	310.88	309.78
29.....	310.08	......	311.53	310.58	310.28	309.68	309.08	309.33	309.38	309.38	310.33	309.88
30.....	309.98	......	311.48	310.68	310.38	309.68	309.43	309.28	309.43	308.98	310.28	309.78
31.....	310.08	......	311.43	......	310.43	......	309.58	309.28	......	309.83	......	309.78

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River at Mouth of Waterhouse Creek, Fulton, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	309.27	310.10	311.08	311.72	310.42	310.57	309.67	309.57	309.12	309.37	309.57	310.17
2.....	309.27	310.07	311.83	311.67	311.02	310.47	309.72	309.37	309.12	308.97	309.57	310.17
3.....	309.20	310.17	312.56	311.47	310.82	310.52	309.42	308.87	309.12	309.37	309.57	310.17
4.....	309.37	310.17	313.13	311.67	310.92	310.37	309.57	309.12	308.87	309.37	309.57	309.67
5.....	309.27	310.07	313.58	311.62	310.87	310.32	309.77	309.12	309.22	309.27	309.52	310.27
6.....	309.17	310.17	313.48	311.47	310.92	310.72	309.72	309.12	309.17	308.97	309.17	310.07
7.....	309.27	309.83	313.22	311.49	310.87	310.67	309.47	308.97	309.27	309.37	309.67	310.07
8.....	309.17	309.83	313.22	311.22	310.67	310.57	309.37	309.37	309.32	309.32	309.57	310.07
9.....	309.17	309.83	313.32	311.17	310.97	310.62	309.27	309.27	309.47	309.07	309.62	309.97
10.....	309.17	309.83	313.32	310.97	310.77	310.57	309.27	309.17	309.42	309.67	309.67	309.97
11.....	309.27	309.93	313.32	311.22	310.77	310.62	309.62	309.17	308.97	309.32	309.67	309.27
12.....	309.27	309.93	313.33	311.02	310.60	310.37	309.27	309.17	309.77	309.67	309.12	309.97
13.....	309.17	309.73	313.17	310.97	310.62	310.62	309.37	309.27	309.72	309.32	309.32	309.77
14.....	309.17	309.93	313.22	310.87	310.52	310.57	309.32	309.02	309.42	309.37	310.22	309.87
15.....	309.17	309.83	312.97	310.87	310.17	310.42	309.37	309.57	309.42	309.37	310.22	309.77
16.....	309.17	309.75	312.92	310.80	310.57	310.52	309.37	309.27	309.47	308.97	310.27	309.67
17.....	309.07	309.83	312.77	310.62	310.32	310.32	308.97	309.22	309.37	309.37	310.22	309.87
18.....	309.07	309.93	312.60	311.00	310.37	310.37	309.42	309.17	309.07	309.32	310.27	309.27
19.....	309.07	309.83	312.42	310.77	310.32	309.97	309.22	309.12	309.57	309.32	310.17	309.87
20.....	309.17	309.69	312.17	310.72	310.37	310.32	309.22	309.22	309.37	309.32	309.47	309.72
21.....	309.17	310.03	312.42	310.67	310.37	310.32	309.22	308.87	309.37	309.32	310.22	309.67
22.....	309.37	309.93	312.22	310.62	310.27	310.17	309.32	309.62	309.37	309.37	310.17	309.67
23.....	309.67	309.93	312.17	310.57	310.57	310.07	309.27	309.27	309.27	309.02	310.37	309.62
24.....	309.87	309.93	312.10	310.47	310.42	309.97	308.82	309.17	309.37	309.57	310.07	309.62
25.....	309.97	310.01	311.97	310.77	310.47	309.87	309.32	309.27	308.97	309.42	310.37	309.27
26.....	309.27	309.93	311.92	310.67	310.57	309.52	309.27	309.27	309.47	309.32	310.37	309.22
27.....	310.17	309.80	311.87	310.57	310.52	310.02	308.97	309.22	309.22	309.37	309.37	310.02
28.....	310.17	310.43	312.02	310.67	310.62	309.77	309.02	309.02	309.27	309.22	310.37	309.87
29.....	310.27	......	311.87	310.62	310.37	309.77	309.02	309.62	309.37	309.57	310.37	310.02
30.....	310.27	......	311.87	310.67	310.57	309.87	309.32	309.27	309.37	309.02	310.27	309.97
31.....	310.27	......	311.77	......	310.57	......	309.42	309.17	......	309.67	......	309.87

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River above Oswego Falls Dam, Fulton, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	347.40	348.00	349.40	350.10	350.15	348.95	347.40	347.10	347.55	347.30	347.30	348.40
2.....	347.30	347.80	350.00	350.10	349.50	348.90	347.60	347.30	347.30	347.90	347.40	348.40
3.....	347.30	348.00	350.50	351.68	349.30	349.00	348.50	347.40	347.40	347.20	347.00	348.30
4.....	347.40	347.80	350.50	350.15	349.40	348.80	348.70	347.30	348.10	347.20	347.30	349.20
5.....	347.40	347.90	350.70	350.10	349.30	349.75	347.80	347.30	347.35	347.40	347.80	348.60
6.....	347.40	347.80	351.45	349.90	349.25	349.35	347.20	347.40	347.50	347.50	348.40	348.30
7.....	347.40	348.00	351.20	349.80	349.25	349.15	346.95	347.60	347.40	347.30	347.40	348.10
8.....	347.30	347.50	351.30	349.75	350.17	348.95	347.20	347.25	347.50	347.30	346.70	347.70
9.....	347.30	347.50	351.35	349.60	349.40	349.05	347.40	347.25	347.50	348.30	346.80	347.60
10.....	347.20	347.50	351.60	350.40	349.05	348.95	318.40	347.20	347.50	347.45	348.30	347.50
11.....	347.20	347.40	351.45	349.70	349.05	348.00	347.40	347.25	348 50	347.40	348.20	348.10
12.....	347.30	347.50	351.45	349.50	348.80	349.95	346.70	347.40	347.65	347.40	347.80	347.30
13.....	347.30	348 70	352.05	349.35	348.70	349.05	347.10	347.40	347.20	347.30	349.10	347.20
14.....	347.30	347.40	351.40	349.35	348.70	348.85	346.80	348.00	347.50	347.40	348.10	347.10
15.....	347.40	347.50	351.20	349.35	349.75	348.65	347.10	347.30	347.40	347.20	347.60	347.20
16.....	347.40	347.40	351.05	349.25	348.85	348.75	347.20	347.40	347.50	348.20	347.60	346.70
17.....	346.70	347.20	350.80	350.15	348.40	348.60	348.30	347.50	347.00	347.30	347.50	347.20
18.....	347.00	347.40	350.70	349.50	348.60	349.40	347.20	347.45	348.20	347.20	347.70	348.10
19.....	347.20	347.10	350.70	349.55	348.40	349.45	347.55	347.45	347.30	347.40	347.90	346.90
20.....	347.30	348.80	351.30	349.20	348.60	348.55	347.40	347.55	347.50	347.30	349.20	346.30
21.....	347.20	347.70	350.70	349.15	348.65	348.15	347.30	348.10	347.30	347.40	348.30	346.80
22.....	347.40	347.70	350.50	349.00	348.75	348.05	347.20	347.55	347.30	347.40	347.90	347.00
23.....	318.60	347.60	350.30	349.05	349.00	347.85	347.30	347.50	347.30	348.20	348.10	348.10
24.....	348.30	347.40	350.20	350.00	348.70	347.75	347.90	347.60	347.50	347.00	348.30	347.10
25.....	348.40	347.50	350.35	349.30	348.85	347.70	347.25	347.40	348.20	347.20	348.30	348.70
26.....	347.90	347.50	350.35	349.15	349.00	348.90	347.20	347.35	347.30	347.30	348.30	348.70
27.....	347.80	348.40	351.15	349.00	349.15	348.25	346.95	347.40	347.60	347.40	349.20	347.60
28.....	348.00	348.25	350.40	349.05	349.15	347.20	347.30	348.10	347.20	347.40	348.50	347.30
29.....	348.10	......	350.30	349.15	350.25	347.30	347.30	347.30	347.20	347.40	348.10	347.20
30.....	349.20	......	350.20	349.30	349.50	347.15	347.30	347.30	347.20	348.30	348.20	347.30
31.....	348.40	......	350.20	......	349.00	......	347.80	347.40	......	347.40	......	347.60

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River at Mouth of Ox Creek near Fulton, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	347.51	349.71	350.91	351.51	350.71	349.81	348.21	347.81	347.71	347.61	347.61	349.21
2.....	347.41	349.51	352.21	351.41	350.41	349.71	348.21	347.61	347.31	348.01	347.71	349.21
3.....	347.61	349.11	352.71	351.71	350.31	349.71	348.61	347.61	347.61	347.61	347.81	349.21
4.....	347.81	348.61	353.01	351.41	350.41	349.61	348.61	347.51	347.71	347.61	347.91	349.71
5.....	347.71	349.11	353.01	351.21	350.41	350.11	348.41	347.51	347.71	347.71	347.81	349.21
6.....	347.61	349.51	353.21	351.11	350.31	350.11	348.21	347.51	347.71	347.71	348.61	349.11
7.....	347.61	349.11	353.31	351.01	350.31	350.01	348.11	347.91	347.71	347.81	348.11	349.01
8.....	347.61	349.11	353.41	350.81	350.71	349.81	347.91	347.81	347.71	347.91	347.81	349.01
9.....	347.51	348.81	353.51	350.71	350.31	349.91	347.91	347.61	347.81	348.41	348.21	349.01
10.....	347.41	348.81	353.61	351.01	350.11	349.91	348.21	347.61	347.91	347.91	348.61	349.01
11.....	347.61	348.71	353.61	350.71	350.01	349.81	348.21	347.71	348.31	347.71	348.51	349.61
12.....	347.51	348.91	353.61	350.51	349.81	350.31	347.41	347.71	347.91	347.71	348.71	349.11
13.....	347.51	349.21	353.71	350.51	349.71	349.61	347.81	347.71	347.81	347.61	349.31	349.01
14.....	347.51	349.01	353.41	350.41	349.61	349.51	347.51	348.01	347.61	347.71	348.71	348.51
15.....	347.51	348.91	353.31	350.31	350.01	349.51	347.81	347.81	347.71	347.71	348.81	348.41
16.....	347.61	348.91	353.11	350.21	349.61	349.41	347.81	347.71	347.71	348.21	348.71	348.61
17.....	347.61	348.81	352.71	350.71	349.41	349.31	348.31	347.71	347.81	347.71	348.71	348.51
18.....	347.61	348.81	352.61	350.41	349.51	349.61	348.01	347.81	348.21	347.71	348.71	349.21
19.....	347.71	348.91	352.51	350.21	349.31	349.71	347.91	347.71	347.81	347.61	348.81	348.71
20.....	347.61	349.21	352.61	350.21	349.41	349.31	347.81	347.71	347.71	347.71	349.51	348.21
21.....	347.61	348.91	352.31	350.21	349.51	348.91	347.81	348.01	347.51	347.71	348.91	348.11
22.....	348.11	348.91	352.11	350.01	350.01	348.91	347.81	347.71	347.61	347.61	348.71	348.21
23.....	349.11	348.91	352.01	349.91	349.71	348.81	347.81	347.71	347.71	348.21	348.91	349.01
24.....	348.21	348.91	351.91	350.31	349.71	348.71	348.11	347.61	347.71	347.71	349.11	348.61
25.....	348.71	349.01	351.91	350.11	349.71	348.61	347.81	347.61	348.11	347.71	349.01	348.91
26.....	349.21	349.11	351.81	349.91	349.81	349.11	347.81	347.71	347.71	347.81	349.21	349.11
27.....	349.31	349.51	352.11	349.81	349.91	348.61	347.91	347.61	347.51	347.71	349.71	349.01
28.....	349.41	350.01	351.81	350.01	350.01	348.21	347.91	348.01	347.61	347.71	349.21	348.61
29.....	349.61	......	351.71	350.01	350.41	348.11	347.91	347.71	347.71	347.71	349.11	348.61
30.....	349.91	......	351.61	350.21	350.41	348.01	347.91	347.41	347.71	348.31	349.11	348.81
31.....	349.71	......	351.51	......	350.01	......	348.01	347.71	......	347.91	......	349.01

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River below site of Horseshoe Dam, near Phoenix, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	*a*	350.34	352.64	351.94	*a*	350.04	348.24	348.04	348.04	347.94	348.24	349.34
2......	*a*	350.14	353.14	351.84	350.64	349.94	348.24	348.04	348.04	*a*	348.14	349.34
3......	349.14	350.14	*a*	*a*	350.64	349.81	*a*	348.04	347.64	347.94	348.04	349.34
4......	349.24	350.14	353.94	351.84	350.64	349.74	*a*	347.91	*a*	347.84	348.04	*a*
5......	349.44	350.14	353.94	351.54	350.64	*a*	348.54	347.94	347.74	347.84	347.94	349.44
6......	349.34	*a*	*a*	351.44	350.54	350.44	348.54	347.94	347.84	347.84	*a*	349.44
7......	349.24	349.94	353.84	351.24	350.54	350.14	348.24	*a*	347.94	347.94	348.44	349.34
8......	349.14	349.84	353.84	351.24	*a*	350.04	348.24	347.94	347.91	347.94	348.44	349.24
9......	*a*	349.64	353.94	351.14	350.64	350.04	347.94	347.94	347.94	*a*	348.04	349.34
10......	348.84	349.64	353.94	*a*	350.64	350.04	*a*	347.74	347.94	347.94	348.04	349.54
11......	348.84	349.64	354.04	350.94	350.24	350.01	348.14	347.74	*a*	347.94	348.84	*a*
12......	348.84	*a*	353.94	350.84	350.04	*a*	347.94	347.74	348.34	347.74	348.84	350.24
13......	348.74	*a*	*a*	350.81	350.04	350.44	348.04	347.84	348.14	347.74	*a*	350.34
14......	348.74	349.84	353.94	350.64	349.84	349.84	348.04	*a*	347.94	347.84	348.84	350.24
15......	348.84	349.84	353.84	350.64	*a*	349.74	347.94	347.94	347.84	347.94	318.84	349.34
16......	*a*	349.94	353.84	350.64	319.84	349.61	347.94	347.94	347.84	*a*	348.84	350.14
17......	348.74	349.94	353.14	*a*	349.84	349.64	*a*	347.94	347.84	347.94	349.04	350.64
18......	348.64	349.94	353.04	350.74	349.84	349.54	347.94	347.94	*a*	348.04	349.14	*a*
19......	348.64	349.94	353.04	350.54	349.44	*a*	347.94	347.94	347.84	317.94	349.24	350.84
20......	348.64	*a*	*a*	350.44	349.44	349.04	347.94	348.04	347.94	348.04	*a*	350.84
21......	348.64	350.04	352.74	350.34	349.44	349.04	347.94	*a*	347.91	348.04	349.24	350.24
22......	348.84	350.04	352.44	350.34	*a*	349.04	347.94	347.94	347.94	348.04	349.24	350.34
23......	*a*	350.04	352.24	350.24	349.84	348.94	347.91	347.94	347.91	*a*	349.24	350.34
24......	350.14	350.04	352.24	*a*	349.84	348.94	*a*	347.94	347.94	347.94	349.34	350.34
25......	350.14	350.04	352.24	350.14	349.91	348.74	348.14	347.74	*a*	347.94	349.44	*a*
26......	350.24	350.04	352.14	350.24	350.04	*a*	348.14	347.84	347.94	347.84	349.44	350.54
27......	350.24	*a*	*a*	350.14	350.14	349.24	348.14	347.84	347.94	347.94	*a*	350.54
28......	350.44	351.84	352.14	350.14	350.14	349.04	348.01	*a*	347.94	347.94	349.44	350.54
29......	350.44	......	352.04	350.14	*a*	348.84	348.04	347.94	347.94	347.94	349.34	350.64
30......	*a*	......	352.04	350.14	350.04	348.24	348.04	347.94	347.94	*a*	349.34	350.74
31......	350.44	......	351.94	......	350.04	......	......	347.94	......	347.94	......	350.84

a No record.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River above site of Horseshoe Dam, near Phoenix, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	*a*	351.40	353.40	353.15	*a*	351.15	350.05	349.55	349.85	349.75	350.25	350.75
2......	*a*	351.20	354.20	353.15	351.75	351.05	349.95	349.55	349.75	*a*	350.15	350.75
3......	350.10	351.30	*a*	*a*	351.65	350.95	*a*	349.55	349.35	349.75	350.15	350.75
4......	350.30	351.30	354.75	352.75	351.75	350.85	*a*	349.65	*a*	349.75	350.15	*a*
5......	350.50	351.40	354.55	352.65	351.65	*a*	349.95	349.65	349.65	349.75	350.15	350.75
6......	350.40	*a*	*a*	352.55	351.55	351.45	349.95	349.65	349.75	349.75	*a*	350.75
7......	350.40	351.20	354.65	352.45	351.55	351.25	349.95	*a*	349.75	349.75	350.15	350.65
8......	350.30	351.10	354.85	352.45	*a*	351.25	349.75	349.45	349.75	349.75	350.15	350.55
9......	*a*	351.00	355.05	352.15	351.65	351.25	349.75	349.35	349.85	*a*	350.15	350.55
10......	350.50	350.90	355.05	*a*	351.55	351.15	*a*	349.45	349.85	349.85	350.15	350.45
11......	350.50	350.80	355.15	352.05	351.35	351.15	349.65	349.45	*a*	349.95	350.15	*a*
12......	350.40	*a*	355.05	351.95	351.05	*a*	349.75	349.45	350.15	349.95	350.45	350.75
13......	350.30	*a*	*a*	351.85	351.05	351.25	349.75	349.45	349.95	349.95	*a*	350.75
14......	350.30	351.10	355.25	351.75	350.95	350.95	349.75	*a*	349.85	349.95	350.45	350.65
15......	350.20	351.10	355.15	351.75	*a*	350.85	349.65	349.55	349.85	349.85	350.45	350.25
16......	*a*	351.10	354.95	351.75	350.55	350.75	349.75	349.55	349.85	*a*	350.55	350.55
17......	350.50	351.00	354.35	*a*	350.55	350.75	*a*	349.55	349.85	349.75	350.55	351.15
18......	350.40	351.00	354.25	351.75	350.55	350.75	349.55	349.65	*a*	349.75	350.55	*a*
19......	350.40	351.00	354.15	351.55	350.75	*a*	349.55	349.65	349.75	349.85	350.55	351.35
20......	350.40	*a*	*a*	351.45	350.75	350.45	349.55	349.55	349.75	349.85	*a*	350.75
21......	350.40	351.10	353.85	351.35	350.75	350.45	349.55	*a*	349.75	349.85	350.55	350.65
22......	350.60	351.10	353.65	351.25	*a*	350.35	349.65	349.65	349.75	349.85	350.45	350.80
23......	*a*	351.10	353.75	351.15	351.05	350.25	349.65	349.65	349.75	*a*	350.45	350.80
24......	351.00	351.10	353.55	*a*	351.05	350.25	*a*	349.65	349.75	349.95	350.55	350.80
25......	351.00	351.10	353.55	351.15	351.05	350.25	349.65	349.45	*a*	349.95	350.75	*a*
26......	351.20	351.10	353.35	351.25	351.15	*a*	349.65	349.45	349.75	349.95	350.75	351.10
27......	351.30	*a*	*a*	351.25	351.25	350.15	349.65	349.45	349.65	349.95	*a*	351.10
28......	351.50	351.50	353.15	351.25	351.25	350.05	349.55	*a*	349.75	349.95	350.75	351.10
29......	351.50	......	353.15	351.35	*a*	350.05	349.55	349.55	349.75	349.95	350.75	351.10
30......	*a*	......	353.05	351.35	351.15	350.15	349.55	349.55	349.75	*a*	350.75	351.10
31......	351.40	......	353.05	......	351.15	......	*a*	349.55	......	349.95	......	351.10

a No record.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River at Hinmansville, Bridge.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	351.44	352.84	355.24	354.94	353.14	352.64	351.04	350.14	350.44	350.34	350.84	351.94
2......	350.29	352.54	356.24	355.14	353.34	352.54	350.84	350.34	350.24	349.54	350.84	351.84
3......	351.14	352.34	357.44	354.54	353.14	352.44	350.64	350.24	350.04	350.44	350.94	351.84
4......	351.24	352.34	356.44	354.64	353.24	352.24	350.54	350.14	*a*	350.44	350.94	351.64
5......	351.14	352.34	356.24	354.44	353.24	352.44	350.64	350.14	350.14	350.44	351.04	352.04
6......	350.94	352.34	356.34	354.24	353.14	352.74	350.64	350.14	350.24	350.34	350.44	351.84
7......	350.94	352.34	356.64	354.14	353.14	352.74	350.34	349.44	350.34	350.44	351.04	351.84
8......	*a*	352.04	356.84	354.14	353.14	352.64	350.34	350.14	350.34	350.44	351.04	351.64
9......	350.44	352.04	356.94	353.84	353.24	352.64	350.44	350.04	350.54	350.14	351.04	351.64
10......	350.94	352.04	357.04	353.54	353.04	352.64	350.04	350.14	350.54	350.64	351.24	351.84
11......	351.14	352.24	357.24	353.74	352.94	352.64	350.44	350.14	350.34	350.64	351.24	351.64
12......	351.04	352.24	357.14	353.54	352.54	352.44	350.34	350.14	350.84	350.64	351.34	351.84
13......	350.94	351.94	356.84	353.44	352.54	352.54	350.44	350.24	350.64	350.64	350.84	351.74
14......	351.04	352.24	356.94	353.34	352.44	352.34	350.34	349.54	350.54	350.64	351.44	351.54
15......	351.04	352.24	356.84	353.24	352.34	352.24	350 24	350.34	350.44	350.64	351.54	351.14
16......	350.44	352.34	356.74	353.24	352.24	352.14	350.44	350.34	350.44	349.94	351.64	351.64
17......	351.04	352.34	356.34	353.14	352.14	352.14	349.84	350.34	350.44	350.44	351.64	351.84
18......	351.04	352.34	356.24	353.34	352.14	351.94	350.04	350.34	350.04	350.44	351.64	351.64
19......	351.14	352.34	356.24	353.14	352.14	351.74	350.24	350.34	350.64	350.54	351.74	351.84
20......	351.04	352.04	355.44	353.04	352.14	351 74	350.34	350.34	350.44	350.44	351.44	351.44
21......	351.04	352.54	355.74	352.84	352.24	351.64	350.24	349.74	350.34	350.44	351.74	351.34
22......	351.44	352.54	355.64	352.74	352.14	351.54	350.24	350.34	350.24	350.44	351.74	351.44
23......	351.44	352.54	355.44	352 64	352.44	351.44	350.34	350.34	350.34	350.04	351.74	351.44
24......	351.44	352.54	355.44	352.64	352.24	351.34	350.24	350.24	350.34	350.64	351.84	351.44
25......	352.04	352.54	355.34	352.94	352.44	351.34	350.34	350.14	349.84	350.54	351.84	351.04
26......	352.14	352.54	355.14	353.04	352.54	351.04	350.14	350.14	350.34	350.54	351.84	351.54
27......	352.44	352.24	354.94	352.64	352.64	351.34	350.14	350.14	350.34	350.74	350.64	352.04
28......	352.64	353.94	355.14	352.74	352.74	351.34	350.14	349.34	350.34	350.54	351.94	351.74
29......	352.64	......	355 04	352.94	352.64	351.24	350.14	349.44	350.34	350.64	351.94	351.84
30......	352.54	......	354.94	352.94	352.74	351.04	350.14	349.44	350.34	350.14	351.94	352.04
31......	352.84	......	354.94	.....	352.64	......	350.04	350.34	......	350.64	......	352.14

a No record.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River below Dam at Phoenix N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	*a*	*a*	357.65	357.45	355.15	354.15	353.25	*a*	352.50	*a*	353.45	*a*
2......	*a*	*a*	359.25	357.25	355.25	354.05	353.25	*a*	352.55	*a*	353.45	*a*
3......	*a*	*a*	359.05	356.95	355.35	354.05	353.25	*a*	352.55	*a*	353.45	*a*
4......	*a*	*a*	358.85	356.75	355.35	353.95	353.25	*a*	352.45	*a*	353.45	353.75
5......	*a*	*a*	358.95	356.65	355.35	353.95	353.25	*a*	352.35	*a*	353.45	353.75
6......	*a*	*a*	359.15	356.55	355.25	354.15	353.25	*a*	352.45	*a*	353.45	353.75
7......	*a*	*a*	359.65	356.45	355.05	354.45	353.25	*a*	352.65	*a*	353.55	353.65
8......	*a*	*a*	360.45	356.25	354.75	354.75	353.25	*a*	352.75	*a*	353.45	353.65
9......	*a*	*a*	360.45	356.15	354.95	354.70	353.25	*a*	352.85	*a*	353.45	353.65
10......	*a*	*a*	360.45	355.95	354.95	354.70	353.25	*a*	352.85	*a*	353.55	353.65
11......	*a*	*a*	360.45	355.85	354.95	354.75	353.25	*a*	352.75	*a*	353.55	353.45
12......	*a*	*a*	360.25	355.65	354.95	354.60	353.25	*a*	352.85	353.35	353.55	353.75
13......	*a*	354.55	359.95	355.55	354.65	354.45	353.25	*a*	352.85	353.45	353.75	353.75
14......	*a*	354.55	359.95	355.45	354.45	354.35	353.25	*a*	352.75	353.55	353.95	353.55
15......	*a*	354.55	359.95	355.35	354.25	354.25	353.25	*a*	*a*	353.55	353.95	353.55
16......	*a*	354.45	359.50	355.35	354.25	354.15	353.25	*a*	*a*	353.35	353.95	353.55
17......	*a*	354.45	359.30	355.25	354.15	354.05	353.25	*a*	*a*	353.45	353.95	353.45
18......	*a*	354.45	359.15	355.35	354.15	353.85	353.25	*a*	353.45	353.45	353.95	353.45
19......	*a*	354.45	358.85	355.25	354.15	353.75	353.25	*a*	353.45	353.55	353.95	353.75
20......	*a*	354.35	358.45	355.15	354.15	353.75	353.25	*a*	353.45	353.55	353.85	353.75
21......	*a*	354.55	358.35	354.95	354.05	353.65	353.25	*a*	353.45	353.45	353.95	353.65
22......	*a*	354.45	358.35	354.75	353.95	353.55	353.25	*a*	*a*	353.45	353.95	353.65
23......	*a*	354.55	358.15	354.75	354.15	353.45	353.25	*a*	*a*	353.35	353.95	353.65
24......	*a*	354.55	358.15	354.75	354.25	353.35	353.25	*a*	*a*	353.55	353.95	353.65
25......	*a*	354.50	357.90	354.75	354.55	353.35	353.25	*a*	*a*	353.55	354.05	353.65
26......	*a*	354.50	357.75	354.75	354.65	353.25	353.25	*a*	*a*	353.45	354.20	353.65
27......	*a*	354.45	357.75	354.75	354.75	353.25	353.25	352.55	*a*	353.45	354.15	353.65
28......	*a*	356.15	357.65	354.75	354.75	353.25	353.25	352.55	*a*	353.55	353.95	353.75
29......	*a*	......	357.55	354.85	354.65	353.25	353.25	352.65	*a*	353.45	353.85	353.85
30......	*a*	......	357.55	354.95	354.55	353.25	353.25	352.60	*a*	353.35	353.85	354.05
31......	*a*	......	357.45	......	354.55	......	353.25	352.30	......	353.45	......	354.65

a No record.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oswego River above Dam at Phoenix N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	360.09	362.04	362.79	362.99	362.39	361.69	360.79	360.39	360.24	360.09	360.99	361.89
2......	360.64	362.04	363.29	362.89	362.24	361.69	360.74	360.29	360.34	360.54	360.89	361.89
3......	360.49	361.99	363.59	363.04	362.24	361.69	360.79	360.19	360.59	360.39	360.94	361.94
4......	360.29	362.04	363.79	362.89	362.19	361.74	360.69	360.29	361.19	360.29	360.94	362.19
5......	359.89	361.99	364.04	362.79	362.19	361.94	360.59	360.14	361.19	360.24	360.94	361.99
6......	359.69	362.14	364.29	362.74	362.19	361.79	360.49	359.69	361.19	360.44	361.54	361.89
7......	359.59	362.09	364.69	362.64	362.14	361.84	360.29	360.69	361.04	360.54	361.29	361.79
8......	359.59	362.04	364.59	362.59	362.39	361.89	360.79	360.39	360.99	360.39	361.29	361.79
9......	360.49	362.09	364.59	362.49	362.19	361.94	360.79	360.19	361.04	361.19	361.29	361.69
10......	359.89	362.09	364.59	362.59	362.09	361.99	361.14	360.09	361.09	360.94	361.29	361.69
11......	359.59	362.09	364.59	362.49	361.99	362.09	361.04	360.29	361.39	360.79	361.29	361.79
12......	359.49	362.09	364.59	362.44	361.89	361.99	360.89	360.19	360.99	360.59	361.49	361.59
13......	359.49	362.29	364.79	362.39	361.84	361.74	360.79	360.29	360.79	360.54	361.99	361.39
14......	359.44	362.19	364.49	362.29	361.79	361.69	360.69	361.09	360.74	360.79	361.69	361.34
15......	359.59	362.19	364.29	362.24	361.94	361.69	360.64	360.69	360.89	360.84	361.79	361.29
16......	360.19	362.09	364.19	362.24	361.74	361.64	360.54	360.44	360.49	361.19	361.79	361.29
17......	360.09	362.09	364.09	362.39	361.69	361.59	360.69	360.49	360.54	360.99	361.79	361.19
18......	359.99	362.09	363.94	362.24	361.69	361.59	360.59	360.64	360.99	361.09	361.79	361.69
19......	359.84	362.09	363.84	362.24	361.74	361.69	360.54	360.64	360.79	361.14	361.79	361.39
20......	360.19	362.19	363.79	362.19	361.79	361.44	360.54	360.69	360.74	360.84	362.04	361.34
21......	360.54	361.99	363.69	362.14	361.79	361.29	360.49	360.94	360.29	360.84	361.79	361.29
22......	360.89	361.99	363.59	361.99	361.94	361.24	360.44	360.79	359.94	360.99	361.79	361.24
23......	361.59	361.99	363.44	361.99	361.74	361.19	360.64	360.49	360.29	361.24	361.79	361.19
24......	361.49	361.99	363.39	361.99	361.79	361.14	360.99	360.54	359.89	360.99	361.79	361.09
25......	361.79	362.04	363.34	361.99	361.84	361.09	360.99	360.49	360.79	360.79	361.79	361.44
26......	361.79	362.09	363.29	362.04	361.89	361.14	360.79	360.09	360.49	360.54	361.84	361.69
27......	361.99	362.19	363.29	362.04	361.94	360.99	360.64	360.29	360.29	360.79	362.24	361.34
28......	362.04	362.29	363.24	362.04	361.99	360.94	360.39	360.69	360.24	361.09	362.04	361.39
29......	362.09	......	363.19	362.09	362.19	360.89	360.19	360.44	360.19	361.04	361.89	361.44
30......	362.29	......	363.14	362.19	362.09	360.84	360.49	360.29	360.14	361.14	361.89	361.49
31......	362.04	......	363.09	......	361.94	......	361.19	360.14	......	360.94	......	361.69

OSWEGO RIVER OPPOSITE BATTLE ISLAND, NEAR MINETTO, N. Y.

A gage was established September 14, 1900, on the Oswego river opposite Battle Island. This station was maintained by the United States Geological Survey in coöperation with this Department. The results may be found in the supplement of the report of the State Engineer and Surveyor of New York for 1902, pages 86–91; for 1903, pages 41–42, and for 1904, pages 512–513. The gage readings were discontinued in 1905. On May 25, 1907, a gage was erected by this Department on the right-hand bank of the Oswego river opposite Battle Island and directly across the stream from the former gage.

The discharge for the year 1907 has not been taken out. On April 26, 1908, a new gage was erected on the left-hand side of the stream, the same side as that on which the old U. S. Geological Survey gage was located, but at a point about 400 feet farther up-stream. This gage is a ⅞-in. by 6-in. board, subdivided to feet and tenths, reading from 5 to 15 feet. It is spiked to a 4-in. by 6-in. post set in the ground, the upper end of which is bolted to a slanting tree. The zero mark of the gage is at elevation 294.53. The zero mark of the old U. S. Geological Survey gage nearby was at elevation 298.16, Barge canal datum. The discharge is calculated from the rating determined in connection with the old U. S. Geological Survey gage, the gage readings being corrected by subtracting 3.67 to reduce them to equivalent readings of the U. S. Geological Survey gage.

During 1910 the gage opposite Battle Island has been read by L. D. Sterling, readings being taken each morning and night. The stream freezes over in part, but no winter discharge measurements are available and the flow for the winter months has been computed from the open water rating table. The winter records for former years, determined in the same manner, probably give somewhat excessive run-off for some months.

Mean Daily Discharge, Second-feet, of Oswego River opposite Battle Island, near Minetto, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	4,585	6,725	9,300	11,280	7,495	6,448	3,465	3,790	3,790	3,660	3,790	6,355
2	3,930	7,203	9,812	11,170	6,725	7,105	3,400	3,335	3,725	2,745	3,860	6,448
3	4,290	7,203	10,745	10,330	6,540	6,262	2,910	3,860	3,660	3,530	3,930	6,355
4	4,290	7,008	12,260	10,540	8,390	6,083	3,530	3,790	3,140	3,465	3,930	5,995
5	4,820	6,910	14,140	10,330	8,090	5,820	3,335	3,660	3,930	3,400	3,930	6,540
6	4,980	6,540	14,924	9,710	7,790	7,008	3,335	3,660	4,000	3,530	2,800	6,355
7	4,980	7,398	15,148	9,812	7,398	7,398	2,330	2,690	3,930	3,596	4,145	5,995
8	4,510	6,540	15,378	9,300	7,300	7,008	2,635	3,660	4,000	3,530	4,290	5,820
9	4,070	6,633	15,732	9,198	7,398	6,910	2,635	3,660	4,070	2,470	4,360	5,733
10	4,220	6,355	14,364	9,812	6,910	6,818	2,380	3,660	4,145	3,725	4,510	5,470
11	4,220	4,900	14,140	9,812	6,540	6,725	2,635	3,860	3,400	3,400	4,660	4,820
12	4,290	4,900	14,252	8,090	6,818	5,908	2,425	3,860	4,220	3,465	4,660	5,385
13	3,790	4,585	13,804	8,190	6,633	7,105	2,635	3,725	3,930	3,400	4,220	5,558
14	3,860	4,820	14,028	8,190	6,540	6,448	2,635	2,800	4,000	3,465	4,660	5,908
15	3,725	5,215	13,692	7,890	10,018	5,995	2,580	3,660	3,930	3,400	4,900	5,908
16	3,660	5,385	13,580	7,690	6,170	5,733	2,580	3,595	3,725	2,745	4,980	5,908
17	3,930	5,908	13,467	7,593	5,995	5,385	2,135	3,530	3,660	3,725	5,645	5,908
18	4,070	6,170	13,355	7,790	5,385	5,385	2,745	4,070	2,690	3,400	5,733	5,908
19	3,860	6,170	12,915	7,690	5,470	4,660	2,525	4,145	3,860	3,270	5,733	5,995
20	3,595	5,995	12,260	7,398	5,385	5,470	2,470	3,930	3,530	3,335	5,470	5,820
21	3,930	6,448	12,808	7,203	5,470	4,820	2,525	2,910	3,595	3,270	6,170	5,558
22	4,145	6,355	13,022	6,910	4,585	4,290	2,470	4,070	3,595	3,270	6,448	5,385
23	5,470	6,083	13,130	6,725	6,170	4,070	2,470	3,790	3,400	2,800	6,448	5,215
24	6,083	5,820	13,022	7,105	5,995	4,145	2,280	3,660	3,530	3,395	6,540	4,820
25	6,083	6,170	12,915	7,008	6,355	4,070	2,910	3,725	2,635	3,465	6,633	4,660
26	6,083	7,203	13,022	6,910	6,448	3,400	3,270	3,790	2,965	3,270	6,355	6,083
27	6,540	8,490	12,040	6,910	7,008	4,070	3,660	3,725	2,910	3,270	5,558	6,355
28	6,633	8,992	11,712	7,008	7,008	3,860	3,595	2,690	2,470	3,465	6,540	6,633
29	6,540	......	11,605	7,495	6,910	3,595	3,530	4,290	3,270	3,660	6,355	7,008
30	6,725	......	11,498	7,495	7,398	3,530	3,400	4,000	3,660	2,635	6,355	7,398
31	7,008	......	11,390	......	6,725	......	2,635	3,930	......	3,725	......	7,300
Mean	4,804	6,362	13,015	8,419	6,744	5,517	2,840	3,662	3,579	3,345	5,120	5,955

Monthly Discharge of Oswego River opposite Battle Island, near Minetto, N. Y.
[Drainage area, 4,900 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
January	7,008	3,595	4,804	0.98	1.127
February	8,992	4,585	6,362	1.298	1.35
March	15,732	9,300	13,015	2.656	3.054
April	11,280	6,725	8,419	1.718	1.924
May	10,018	4,585	6,744	1.376	1.582
June	7,398	3,400	5,517	1.126	1.261
July	3,660	2,135	2,840	0.58	0.667
August	4,290	2,690	3,662	0.747	0.859
September	4,220	2,470	3,579	0.73	0.818
October	3,725	2,470	3,345	0.683	0.785
November	6,633	2,800	5,120	1.045	1.170
December	7,398	4,660	5,955	1.215	1.397

ONEIDA RIVER DRAINAGE BASIN.

Oneida lake has a water-surface area of 80 square miles and lies at an elevation of 370 feet above tide. The drainage basin within a radius of ten miles to the south and west is relatively flat, with numerous swampy tracts. The lake receives, through Chittenango and Oneida creeks, drainage from an extensive area of the central New York plateau and, through Wood and Fish creeks on the east, drainage from a portion of the west slope of the plateau bordering the Adirondack mountains. On the north the drainage area is less extensive and the inflowing streams are small.[a]

The outflow from the lake through Oneida river joins Seneca river at Three River Point, forming Oswego river. From Brewerton to Three River Point the distance, in a straight line, is but eight miles; following the windings of the stream it is sixteen miles.

Oneida river will be canalized in connection with the Barge canal work. Two large and two smaller bends will be cut off, the largest cut-off being opposite Caughdenoy. The system of eel weirs formerly located in the river at Caughdenoy have been replaced by a substantial masonry dam. A lock has also been placed in the cut-off channel, the object of the dam and lock being to maintain the water at a navigable depth in the canal and river above the lock to the foot of Oneida lake at Brewerton. The dam at Oak Orchard has been removed, and the low navigable stage of the stream from Three River Point up to Lock 26, located in the cut-off at Caughdenoy, will be 363.0, or the same as the pool level in Oswego river from Phoenix to Three River Point.

WATER-SURFACE ELEVATION RECORDS FOR ONEIDA RIVER AND TRIBUTARIES.

The following series of tables shows the mean daily elevation of water-surface at various gaging stations during 1910 as determined from various gages located on Oneida river, Oneida lake and tributaries.

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[a] A portion of the drainage area is shown on the Syracuse, Chittenango, Oneida, Oriskany, Morrisville, Cazenovia and Tully topographic atlas sheets of the United States Geological Survey.

The elevation of water-surface is in all cases referred to Barge canal datum, which is mean tide level at New York city, taken as being 14.73 ft. below a certain bench-mark known as grist mill bench-mark, at Greenbush (Rensselaer), N. Y.

The tables are arranged in order going up-stream from Three River Point and show by comparison the fall in the stream between the different gages. Tables of elevation of water-surface at some additional points in the drainage basin where records of discharge are maintained will be found in connection with the descriptions of the several discharge stations.

Occasionally apparent inconsistencies in the tables of water-surface elevation occur where the water level at an up-stream gage is recorded slightly lower than at a point farther down-stream, but are, as a rule, not the result of actual mistakes, but arise from the fact that most of the gages are read to the nearest tenth foot only, and also owing to the fact that the streams and lakes are sometimes affected by wind to such an extent as to cause the water-surface to be slightly higher at the down-stream end of the level reach than at the up-stream end.

The accompanying table gives details as to the types of gages used, the datum of each and the manner in which they are read.

Water-surface Elevation Gages Maintained on the Oneida River and Tributaries During the Year 1910.

STREAM.	Location.	Date established.	Observer.	Elevation of zero mark (B. C. datum).	Type of gage.	Sub-division of gage.	Readings taken to	USUAL TIME OF READING.	
								A. M.	P. M.
Oneida river	Three River Point	April 16, 1904	John Chamberlain	359.08	Staff	$\frac{1}{10}$ Foot	$\frac{1}{10}$ Foot	7	....
Oneida river	Below dam, Oak Orchard	April 23, 1904	Louis McArthur	360.87	"	"	"	8	5
Oneida river	Above dam, Oak Orchard	Aug. 30, 1902	Louis McArthur	360.83	"	"	"	8	5
Oneida river	Below lock, Caughdenoy.	April 22, 1904	John P. Hiller	364.00	"	"	"	11	....
Oneida river	Above lock, Caughdenoy.	April 22, 1904	John P. Hiller	368.91	"	"	"	11	....
Oneida river	Brewerton	April 22, 1904	Wm. Hubbard	367.03	"	"	"	8	....
Oneida lake	Sylvan Beach	July 1, 1904	Wm. H. Dunn	368.00	"	"	"	9	2
Oneida creek	Below dam, Kenwood	—— —, 1907	H. F. Mason	*a*	"	"	$\frac{5}{100}$ "	A. M.	P. M.
Oneida creek	Above dam, Kenwood	—— —, 1907	H. F. Mason	*a*	"	$\frac{1}{100}$ "	$\frac{5}{100}$ "	A. M.	P. M.
Butternut creek	Jamesville	July 25, 1907	Marie Brant Brown	*a*	Chain	$\frac{1}{10}$ "	$\frac{1}{10}$ "	8	4
Limestone feeder	Fayetteville	Aug. 27, 1905	Henry Straub	425.74	Staff	"	"	7	5
Limestone creek	Above dam, Fayetteville	Aug. 27, 1905	Henry Straub	429.53	"	"	"	7	5
Limestone creek	Manlius	July 23, 1907	John Carroll	*a*	Chain	"	"	8	4
Chittenango creek	Chittenango	May 22, 1901	Bessie M. Kellogg	450.16	Staff	"	"	8	5

a Referred to arbitrary datum.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oneida River at Three River Point, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	360.38	362.38	363.28	364.18	363.08	362.28	361.08	361.18	360.58	360.38	361.18	362.18
2......	361.08	362.28	364.08	364.08	363.18	362.28	361.08	360.98	360.48	360.18	361.08	362.28
3......	361.18	362.28	364.58	363.58	363.08	362.28	361.18	361.08	360.58	361.08	361.08	362.18
4......	360.38	362.28	364.48	363.48	363.08	362.18	361.28	361.08	360.58	360.48	361.08	362.28
5......	360.28	362.28	365.18	363.38	363.08	362.28	361.08	360.58	361.18	360.28	361.18	362.38
6......	360.18	362.28	365.38	363.38	363.08	362.48	360.58	360.48	361.28	360.58	361.38	362.18
7......	360.28	362.38	365.38	363.28	362.48	362.38	360.48	360.48	361.28	360.48	361.48	362.08
8......	360.08	362.28	366.18	363.38	363.08	362.38	361.08	361.08	361.18	360.38	361.38	362.08
9......	360.38	362.28	366.18	363.38	363.18	362.38	361.08	360.48	361.28	361.18	361.38	361.58
10......	361.08	362.28	366.18	363.28	362.58	362.28	361.28	360.48	361.18	361.08	361.48	361.58
11......	360.38	362.18	366.28	363.28	362.48	362.28	361.38	360.58	361.38	361.08	361.48	362.08
12......	360.08	362.18	366.28	363.18	362.38	362.48	361.08	360.58	361.38	360.58	361.58	362.08
13......	360.08	362.28	366.08	363.18	362.28	362.38	361.08	361.08	361.18	360.58	362.18	361.48
14......	360.08	362.38	366.08	362.58	362.28	362.28	361.08	360.48	361.08	360.58	362.18	361.48
15......	360.08	362.28	365.88	363.08	362.28	362.18	360.58	361.18	361.08	361.08	362.08	361.38
16......	360.28	362.18	365.68	363.28	362.38	362.08	360.58	361.08	361.08	361.18	362.08	361.58
17......	361.08	362.18	365.58	363.08	362.18	362.08	361.08	361.18	360.58	361.18	362.08	361.58
18......	360.28	362.18	365.38	362.58	362.18	361.58	361.18	361.08	361.08	361.28	362.08	361.48
19......	360.38	362.18	365.18	362.48	362.08	362.08	360.58	361.08	361.18	361.18	362.08	361.48
20......	360.38	362.28	365.18	362.38	362.18	362.28	360.38	361.08	360.48	361.08	362.18	361.38
21......	360.58	362.38	365.08	362.28	362.08	361.98	361.08	360.48	360.38	361.08	362.28	361.38
22......	361.18	362.28	364.38	362.28	362.18	361.48	360.58	361.18	360.48	361.08	362.08	361.38
23......	361.58	362.18	364.88	362.48	362.38	361.38	360.48	361.08	360.48	361.18	362.08	361.28
24......	362.18	362.28	364.78	362.48	362.18	361.28	360.58	360.58	360.28	361.28	362.18	361.28
25......	262.28	362.18	364.68	362.48	362.18	361.18	361.18	361.08	360.38	361.08	362.18	361.48
26......	362.28	362.18	364.58	362.38	362.28	361.38	360.38	360.58	361.08	360.58	362.18	361.48
27......	362.38	362.28	364.48	362.38	362.38	361.38	360.58	360.28	360.48	361.08	362.28	361.58
28......	362.38	362.48	364.48	362.38	362.38	361.18	360.48	360.38	360.58	361.08	362.38	361.48
29......	362.38	......	364.28	362.48	362.58	361.08	360.48	361.08	360.48	361.08	362.28	361.48
30......	362.48	......	364.18	362.48	363.08	361.18	360.58	360.58	360.38	361.28	362.18	361.58
31......	362.38	......	364.18	......	362.38	......	360.58	360.58	......	361.28	......	361.58

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oneida River below Dam at Oak Orchard, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	361.47	363.37	364.82	365.77	364.32	363.12	361.47	361.17	360.92	360.58	361.37	363.22
2......	361.37	363.32	365.57	365.77	364.07	362.97	361.42	361.17	360.97	360.41	361.42	363.02
3......	361.37	363.37	366.12	365.77	364.17	362.87	361.42	360.79	361.02	360.49	361.57	362.87
4......	361.37	363.37	366.57	365.77	364.17	362.87	361.37	360.37	361.22	360.58	361.57	362.87
5......	361.32	363.37	366.92	365.72	364.22	362.92	361.22	360.37	361.37	360.75	361.57	362.87
6......	361.12	363.42	367.22	365.67	364.22	363.07	361.12	360.37	361.37	360.79	361.62	362.87
7......	361.07	363.22	367.67	365.72	364.27	363.07	361.07	361.17	361.37	360.93	361.67	362.82
8......	360.97	362.92	367.72	365.67	364.32	363.12	361.17	361.22	361.27	361.22	361.77	362.77
9......	360.97	362.97	367.87	365.97	364.37	363.17	361.17	361.42	361.27	361.17	361.77	362.77
10......	360.97	362.97	367.82	365.72	364.52	363.12	361.47	361.42	361.17	361.17	361.92	362.77
11......	360.92	362.87	367.77	365.52	364.72	362.97	361.47	361.17	361.17	361.12	362.37	362.77
12......	360.97	362.87	367.67	365.17	362.87	362.97	361.47	360.97	361.12	361.07	362.57	362.77
13......	360.97	362.87	367.52	364.52	362.87	362.97	361.37	360.97	361.17	361.17	362.67	362.77
14......	360.97	362.87	367.32	364.37	362.87	362.87	361.42	361.17	361.17	361.17	362.77	362.77
15......	360.87	362.87	367.22	364.37	362.82	362.77	361.32	361.17	361.22	361.17	362.77	362.77
16......	360.92	362.82	367.07	364.57	362.77	362.72	361.37	361.22	361.27	361.22	362.72	362.72
17......	360.87	362.72	366.82	364.42	362.77	362.67	361.32	361.17	361.27	361.32	362.77	362.67
18......	360.92	362.77	366.67	364.17	362.72	362.57	361.17	361.07	361.27	361.27	362.77	362.57
19......	361.47	362.77	366.47	364.02	362.72	362.52	360.83	361.12	361.02	361.37	362.77	362.57
20......	361.97	362.67	366.37	363.92	362.67	362.47	360.75	361.17	360.71	361.37	362.77	362.57
21......	362.82	362.67	366.27	363.97	362.72	362.47	360.87	361.12	360.46	361.37	362.77	362.52
22......	363.17	362.67	366.12	364.07	362.87	362.37	360.87	361.07	360.37	361.37	362.77	362.47
23......	363.17	362.72	366.07	363.97	362.87	362.22	360.87	361.07	360.37	361.32	362.77	362.47
24......	363.22	362.77	366.07	363.67	362.87	362.02	361.07	361.07	360.37	361.12	362.77	362.47
25......	363.17	362.77	365.97	363.72	362.92	361.97	361.07	361.07	360.58	360.92	362.77	362.47
26......	363.17	362.97	365.97	364.07	363.17	361.92	360.70	360.41	360.75	360.83	362.92	362.47
27......	363.27	363.32	365.97	364.27	363.37	361.77	360.92	361.22	360.79	360.87	363.12	362.47
28......	363.32	363.87	365.97	364.27	363.37	361.57	360.87	360.97	360.70	360.97	363.22	362.52
29......	363.37	......	365.92	364.27	363.27	361.57	360.92	360.92	360.79	360.97	363.32	362.67
30......	363.37	......	365.87	364.27	363.22	361.52	360.97	360.87	360.79	361.22	363.27	362.77
31......	363.37	......	365.82	......	363.17	......	361.17	360.87	......	361.37	......	362.77

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oneida River above Dam at Oak Orchard, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	364.43	365.23	365.88	367.32	366.62	365.22	365.22	364.72	365.47	364.38	364.43	365.43
2.....	364.48	365.18	366.53	367.32	366.57	365.22	365.22	364.72	365.32	364.13	364.48	365.33
3.....	364.53	365.08	367.03	367.32	366.52	365.22	365.12	364.72	365.32	364.23	364.53	365.33
4.....	364.63	364.93	367.28	367.27	366.52	365.12	365.12	364.32	365.37	364.58	364.53	365.33
5.....	364.63	364.93	367.58	367.22	366.52	365.32	365.12	364.02	365.62	364.78	364.63	365.28
6.....	364.68	364.93	367.83	367.17	366.52	365.42	365.07	364.02	365.57	364.83	364.78	365.23
7.....	364.63	364.93	368.23	367.02	366.52	365.42	364.97	364.22	365.52	364.73	364.83	365.23
8.....	364.63	364.93	368.28	366.77	366.62	365.42	364.82	364.72	365.62	364.58	364.83	365.23
9.....	364.73	364.98	368.43	367.22	366.62	365.47	364.82	364.72	365.62	364.68	364.83	365.23
10.....	364.73	365.03	368.43	367.27	366.72	365.52	364.42	364.72	365.62	364.83	364.88	365.23
11.....	364.68	364.93	368.38	367.12	366.12	365.52	364.42	364.87	365.57	364.83	365.03	365.23
12.....	364.63	364.83	368.18	366.87	364.82	365.42	365.37	365.22	365.23	364.73	365.03	365.23
13.....	364.63	364.73	368.13	366.77	364.92	365.42	365.52	365.22	365.23	364.68	365.13	365.13
14.....	364.58	364.73	367.98	366.72	365.02	365.42	365.52	365.22	365.23	364.63	365.13	365.13
15.....	364.53	364.73	367.83	366.72	365.17	365.42	365.47	365.17	365.18	364.63	365.13	365.03
16.....	364.53	364.73	367.73	366.62	365.22	365.42	365.42	365.22	365.13	364.63	365.18	365.03
17.....	364.53	364.63	367.53	366.62	365.22	365.37	365.42	365.17	365.03	364.53	365.23	365.03
18.....	364.53	364.63	367.38	366.87	365.22	365.32	365.37	365.17	364.93	364.53	365.28	364.93
19.....	364.78	364.68	367.23	366.62	365.17	365.32	365.32	365.22	364.93	364.53	365.33	364.93
20.....	365.03	364.73	367.13	367.02	365.22	365.32	365.17	365.12	364.88	364.53	365.33	364.88
21.....	365.18	364.73	367.13	366.82	365.22	365.32	364.92	365.02	364.93	364.53	365.33	364.83
22.....	365.23	364.73	367.13	366.22	365.32	365.32	364.97	364.92	364.93	364.53	365.33	364.83
23.....	365.23	364.73	367.03	366.17	365.32	365.27	365.22	364.92	364.93	364.18	365.33	364.83
24.....	365.28	364.73	367.08	366.07	365.32	365.22	365.47	364.92	364.88	364.13	365.33	364.83
25.....	365.33	364.73	367.03	366.22	365.42	365.22	365.22	365.02	364.73	364.08	365.38	364.83
26.....	365.38	364.88	367.13	366.47	365.42	365.22	364.92	364.52	364.78	364.13	365.48	364.83
27.....	365.28	365.08	367.13	366.52	365.47	365.12	364.97	364.17	364.93	364.13	365.58	364.73
28.....	365.23	365.33	367.13	366.52	365.52	365.02	365.07	364.87	364.93	364.18	365.68	364.78
29.....	365.23	......	367.08	366.52	365.47	365.22	364.92	365.37	364.93	364.23	365.48	364.98
30.....	365.33	......	367.13	366.52	365.32	365.22	364.92	365.52	364.78	364.38	365.43	365.13
31.....	365.28	......	367.03	......	365.22	......	364.72	365.57	......	364.43	......	365.13

Mean Daily Elevation Water-surface (Barge Canal Datum) of Oneida River below Lock at Caughdenoy, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	364.48	365.58	366.18	368.08	365.78	365.38	364.78	364.68	364.78	364.08	364.28	365.58
2.....	364.48	365.58	366.98	367.98	365.38	365.38	364.78	364.68	364.78	364.28	364.18	365.58
3.....	364.48	365.58	567.58	368.08	365.68	365.28	364.68	364.48	364.88	364.38	364.18	365.58
4.....	364.48	365.58	368.03	368.08	365.58	365.38	364.68	364.38	365.08	364.68	364.08	365.58
5.....	364.48	365.48	368.38	367.88	365.58	365.48	364.68	364.08	365.08	364.78	364.28	365.58
6.....	364.48	365.58	368.78	367.88	365.68	365.38	364.68	363.58	365.18	365.08	364.28	365.58
7.....	364.68	365.58	369.33	367.58	365.48	365.38	364.58	363.88	365.28	364.68	364.78	365.58
8.....	364.58	365.58	369.38	367.48	365.68	365.48	364.58	364.28	365.38	364.88	364.58	365.58
9.....	364.58	365.58	369.53	367.38	365.48	365.58	364.38	364.48	365.38	364.78	364.48	365.48
10.....	364.58	365.58	369.53	367.18	365.38	365.68	364.08	364.78	365.38	364.78	364.58	365.38
11.....	364.68	365.58	369.48	367.28	365.28	365.78	364.08	364.88	365.38	364.68	364.58	365.38
12.....	364.68	365.58	369.43	366.98	365.28	365.58	364.08	364.88	365.28	364.58	364.48	365.38
13.....	364.68	365.58	369.28	366.88	365.28	365.48	364.28	364.98	365.18	364.48	364.48	365.28
14.....	364.68	365.18	369.08	366.88	365.28	365.48	364.28	365.08	365.08	364.48	364.48	365.18
15.....	368.68	365.18	368.98	366.98	365.28	365.38	364.48	365.08	364.78	364.48	364.48	365.18
16.....	364.68	365.18	368.78	366.98	365.08	365.38	365.08	364.88	364.78	364.38	364.38	365.18
17.....	364.68	365.18	368.48	367.28	365.18	365.38	365.08	364.78	364.78	364.28	364.38	365.18
18.....	364.78	365.18	368.38	366.88	365.28	365.38	364.98	364.98	364.78	364.38	364.58	365.08
19.....	364.88	365.18	368.18	366.48	365.28	365.28	364.98	364.78	364.68	364.38	364.78	364.98
20.....	364.88	365.18	368.08	366.38	365.38	365.28	364.98	364.88	364.58	364.38	365.38	364.88
21.....	364.88	365.28	368.08	366.38	365.08	365.08	364.88	364.88	364.48	364.28	365.48	364.88
22.....	365.38	365.28	367.98	366.38	365.08	365.08	364.28	364.88	364.48	364.18	365.58	364.88
23.....	365.28	365.28	367.98	366.38	365.08	365.08	364.28	364.88	364.48	363.78	365.68	364.78
24.....	365.48	365.28	367.98	366.38	365.28	364.88	364.48	364.88	365.08	364.28	365.58	364.88
25.....	365.48	365.28	367.88	366.38	365.48	364.88	364.48	364.88	364.48	363.88	365.68	364.88
26.....	365.58	365.28	367.88	366.38	365.68	365.08	364.28	364.78	364.48	364.18	365.58	364.98
27.....	365.68	365.28	368.18	365.98	365.48	364.98	364.48	364.88	364.68	363.98	365.58	365.08
28.....	365.68	365.48	368.08	365.88	365.48	364.88	364.98	364.88	364.58	363.88	365.78	365.28
29.....	365.58	......	368.28	365.68	365.58	364.78	364.78	364.88	364.58	363.98	365.68	365.28
30.....	365.58	......	368.18	365.38	365.48	364.78	364.48	364.88	364.68	364.08	365.58	365.28
31.....	365.58	......	368.08	......	365.38	......	364.68	364.88	......	364.18	......	365.38

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oneida River above Lock at Caughdenoy, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec
1910.												
1.....	370.89	371.59	371.74	371.60	370.71	370.59	370.16	369.87	369.77	369.25	369.79	370.62
2.....	370.79	371.59	372.04	371.55	370.69	370.51	370.15	369.87	369.87	369.79	369.82	370.57
3.....	370.89	371.49	372.29	371.59	370.72	370.42	370.13	369.85	369.82	369.91	369.87	370.57
4.....	370.89	371.49	372.49	371.59	370.67	370.55	370.11	369.87	369.82	369.83	368.97	370.57
5.....	370.89	371.49	372.54	371.58	370.62	370.62	370.12	369.92	369.87	369.89	369.92	370.57
6.....	370.89	371.59	372.74	371.59	370.62	370.52	370.07	369.87	369.92	370.02	369.89	370.55
7.....	370.99	371.59	372.84	371.51	370.60	370.55	370.05	369.82	368.97	369.83	370.23	370.53
8.....	370.89	371.59	372.84	371.39	370.67	370.55	370.03	369.82	369.87	369.90	370.13	370.55
9.....	370.89	371.69	372.89	371.35	370.55	370.62	370.01	369.83	369.82	369.79	370.25	370.47
10.....	370.89	371.59	372.89	371.23	370.50	370.67	369.99	369.79	369.87	369.82	370.13	370.37
11.....	370.89	371.59	372.89	371.29	370.50	370.72	368.97	369.92	368.97	369.79	370.15	370.37
12.....	370.99	371.59	372.89	371.21	370.50	370.65	369.82	368.97	368.97	369.82	370.18	370.35
13.....	370.99	371.59	372.89	371.19	370.47	370.60	369.77	368.97	369.92	369.81	370.07	370.39
14.....	370.99	371.49	372.79	371.12	370.47	370.57	368.97	369.95	369.92	369.82	370.05	370.37
15.....	370.99	371.39	372.69	371.15	370.47	370.55	369.92	369.93	369.92	369.82	370.09	370.35
16.....	370.99	371.39	372.69	371.19	370.45	370.52	369.87	369.80	369.87	369.81	370.35	370.35
17.....	370.99	371.39	372.59	371.11	370.47	370.51	369.92	369.83	369.87	369.82	370.49	370.32
18.....	371.09	371.49	372.59	371.01	370.27	370.49	369.87	369.81	369.87	369.82	370.35	370.32
19.....	370.99	371.49	372.59	370.92	370.05	370.45	368.97	369.87	369.87	369.81	370.43	370.25
20.....	370.99	371.49	372.59	370.91	370.42	370.42	369.87	369.92	369.82	369.82	370.49	370.27
21.....	370.99	371.59	372.59	370.92	370.35	370.42	369.87	369.92	369.82	369.75	370.57	370.27
22.....	371.29	371.59	372.49	370.92	370.31	370.42	369.85	369.92	369.82	369.79	370.57	370.27
23.....	371.29	371.59	372.49	370.92	370.62	370.42	369.92	369.92	369.77	369.25	370.55	370.33
24.....	371.39	371.49	372.49	370.92	370.55	370.33	369.92	369.91	370.02	369.51	370.57	370.31
25.....	371.39	371.49	372.49	370.91	370.62	370.33	368.97	369.95	369.86	369.77	370.55	370.31
26.....	371.59	371.49	372.49	370.87	370.61	370.27	369.92	369.82	369.83	369.62	370.57	370.35
27.....	371.69	371.49	372.59	370.67	370.60	370.22	369.85	369.77	369.90	369.67	370.57	370.27
28.....	371.59	371.69	372.49	370.65	370.62	370.19	369.85	369.77	369.75	369.75	370.62	370.29
29.....	371.59	......	371.50	370.57	370.65	370.17	369.87	369.82	369.82	369.77	370.65	370.29
30.....	371.59	......	371.61	370.51	370.62	370.15	369.92	369.87	369.92	369.75	370.63	370.39
31.....	371.59	......	371.59	......	370.57	......	369.87	369.87	......	369.79	......	370.41

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oneida River at Brewerton, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.*a*												
1.....	372.08	370.88	371.58	373.18	372.28	371.28	370.48	370.18	368.96	368.66	368.66	369.26
2.....	372.08	370.78	371.58	373.08	372.58	371.18	370.48	370.08	368.86	368.66	368.66	369.36
3.....	372.08	370.78	371.58	372.98	372.68	371.18	370.48	370.08	368.96	368.66	368.36	369.36
4.....	372.08	370.78	371.58	372.98	372.78	371.18	370.48	370.08	368.96	368.66	368.46	369.46
5.....	372.18	370.78	371.58	372.98	372.78	371.18	370.38	369.98	368.96	368.66	368.56	369.36
6.....	372.08	370.78	371.48	372.98	372.68	371.18	370.28	370.08	368.96	368.66	368.56	369.36
7.....	371.88	370.68	371.48	372.88	372.18	371.08	370.28	369.98	368.96	368.66	368.66	369.36
8.....	371.88	370.58	371.48	372.88	372.68	371.08	370.28	369.98	368.96	368.66	368.66	369.26
9.....	371.88	370.58	371.48	372.88	372.48	370.98	370.28	369.98	368.96	368.66	368.66	369.26
10.....	371.88	370.58	371.48	372.88	372.58	370.98	370.28	369.98	368.96	368.66	368.76	369.36
11.....	371.88	370.58	371.48	372.68	372.58	370.88	370.18	369.98	368.96	368.76	368.66	369.46
12.....	371.68	370.48	371.58	372.78	372.58	370.78	370.18	369.98	368.96	368.66	368.66	369.46
13.....	371.58	370.48	371.68	372.88	372.48	370.68	370.08	369.88	368.96	368.66	368.76	369.46
14.....	371.58	370.48	371.78	372.98	372.38	370.58	370.08	369.78	368.96	368.66	368.76	369.56
15.....	371.58	370.58	372.08	372.98	372.38	370.58	369.98	369.68	368.96	368.66	368.86	369.66
16.....	371.58	371.18	372.28	372.88	372.38	370.88	369.88	369.68	368.86	368.66	368.86	369.66
17.....	371.48	371.28	372.38	372.88	372.28	370.98	369.78	369.68	368.76	368.66	368.96	369.66
18.....	371.38	371.68	372.38	372.88	372.28	370.98	369.68	369.58	368.76	368.66	368.86	369.76
19.....	371.38	371.88	372.48	372.88	371.68	371.08	369.78	369.48	368.76	368.66	368.96	369.76
20.....	371.38	371.88	372.58	372.88	371.68	370.98	369.88	369.48	368.76	368.66	368.96	369.76
21.....	371.28	371.88	372.58	372.58	371.68	370.88	370.08	369.48	368.76	368.66	369.06	369.86
22.....	371.18	371.88	372.48	372.58	371.68	370.88	370.08	369.48	368.76	368.66	369.06	369.86
23.....	371.08	371.88	372.48	372.88	371.68	370.88	370.38	369.28	368.76	368.66	369.06	369.86
24.....	371.08	371.88	372.48	372.78	371.68	370.88	370.48	369.28	368.76	368.66	369.06	369.86
25.....	371.08	371.78	372.48	372.78	371.68	370.78	370.58	369.18	368.66	368.66	369.16	369.86
26.....	371.08	371.78	372.48	372.68	371.58	370.78	370.48	369.18	368.66	368.76	369.16	369.86
27.....	371.08	371.78	372.58	372.68	371.58	370.68	370.38	369.46	368.66	368.86	369.16	369.86
28.....	371.08	371.68	372.68	372.68	371.48	370.58	370.28	369.36	368.66	368.86	369.26	369.86
29.....	371.08	371.68	372.98	372.48	371.48	370.48	370.28	369.16	368.76	368.76	369.26	369.96
30.....	370.98	......	373.08	372.48	371.48	370.48	370.28	369.16	368.86	368.66	369.26	369.96
31.....	370.88	......	373.18	......	371.48	......	370.18	369.06	......	368.66	......	369.96

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a This table supersedes that appearing in 1908 report, page 488, which is referred to incorre datum.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oneida River at Brewerton, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.*a*												
1.....	369.96	371.76	372.86	372.36	373.56	371.86	370.56	370.26	369.96	369.76	370.06	370.26
2.....	370.06	371.76	372.76	372.46	373.66	371.86	370.56	370.26	369.86	369.76	370.06	370.26
3.....	370.06	371.76	372.66	372.56	373.76	371.86	370.46	370.16	369.96	369.76	370.06	370.26
4.....	370.06	371.76	372.66	372.56	373.66	371.86	370.46	370.16	370.06	369.76	370.06	370.26
5.....	370.06	371.76	372.56	372.66	373.56	371.86	370.36	370.16	370.36	369.76	370.06	370.26
6.....	370.16	371.66	372.46	372.86	373.66	371.86	370.46	370.16	370.06	369.86	370.06	370.26
7.....	370.26	371.66	372.36	372.66	373.66	371.96	370.36	370.06	369.96	369.86	370.06	370.36
8.....	370.36	371.56	372.26	373.06	373.66	371.96	370.36	370.06	369.96	369.86	370.06	370.36
9.....	370.46	371.56	372.16	373.16	373.56	371.96	370.36	369.96	369.96	369.86	370.06	370.26
10.....	370.46	371.56	372.16	373.16	373.56	371.86	370.36	370.06	369.96	369.86	370.06	370.26
11.....	370.46	371.66	372.16	373.26	373.56	371.76	370.26	370.06	369.96	369.86	370.06	370.26
12.....	370.56	371.66	372.06	373.26	373.46	371.76	370.16	370.06	369.96	369.86	370.06	370.26
13.....	370.76	371.66	372.06	373.26	373.46	371.66	370.16	370.06	369.96	369.86	370.06	370.56
14.....	370.76	371.66	372.06	372.36	373.46	371.56	370.06	370.06	369.96	369.86	370.06	370.26
15.....	370.86	371.66	371.96	373.06	373.36	371.46	370.06	370.26	370.06	369.86	370.06	370.26
16.....	370.86	371.66	371.96	373.56	373.36	371.46	370.06	370.16	369.96	369.76	370.06	370.26
17.....	370.86	371.66	371.96	373.96	373.36	371.36	369.96	370.16	369.96	369.76	370.06	370.26
18.....	370.86	371.76	371.86	374.06	373.26	371.26	369.86	370.06	369.96	369.76	370.06	370.26
19.....	370.86	371.76	371.76	374.06	373.26	370.96	369.96	370.06	370.06	369.86	370.06	370.16
20.....	370.96	371.86	371.86	374.06	373.16	371.06	370.06	370.06	369.96	369.86	370.06	370.26
21.....	370.96	372.06	371.66	374.26	373.06	371.06	370.06	370.06	369.96	369.96	369.96	370.26
22.....	370.96	372.06	371.56	374.16	372.96	371.06	370.06	370.06	369.96	370.46	370.06	370.26
23.....	370.96	372.36	371.56	373.86	372.86	370.96	370.16	370.06	369.96	369.86	370.06	370.26
24.....	371.26	372.56	371.46	373.76	372.76	370.86	370.26	370.06	369.96	369.86	370.06	370.26
25.....	371.16	372.66	371.46	373.76	372.56	370.86	370.26	370.06	369.86	369.96	370.16	370.26
26.....	371.26	372.86	371.56	373.66	372.46	370.86	370.26	370.06	369.86	369.96	370.16	370.26
27.....	371.46	372.86	371.56	373.56	372.26	370.86	370.26	369.96	369.86	369.96	370.26	370.26
28.....	371.56	372.86	371.76	373.56	372.26	370.76	370.26	369.96	369.86	369.96	370.26	370.26
29.....	371.66	......	372.26	373.76	372.16	370.66	370.36	369.86	369.86	369.96	370.26	370.26
30.....	371.66	......	372.26	373.56	372.06	370.66	370.26	369.96	369.86	369.96	370.26	370.26
31.....	371.76	......	372.36	......	371.96	......	370.36	370.06	......	369.96	......	370.26

a This table supersedes that appearing in 1909 report, page 384, which is referred to incorrect datum.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oneida River at Brewerton, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	370.26	371.06	371.56	372.86	371.36	371.06	370.46	370.06	370.06	370.06	369.96	370.96
2......	370.26	371.06	371.91	372.86	371.36	371.06	370.46	370.06	370.06	370.06	370.06	370.96
3......	370.26	371.06	372.41	372.86	371.26	371.06	370.46	370.06	370.06	370.06	370.06	370.96
4......	370.26	371.06	372.66	372.96	371.16	370.96	370.46	369.86	370.06	370.06	370.06	370.96
5......	370.26	371.06	372.86	372.76	371.16	370.96	370.36	370.06	370.06	370.06	370.06	370.96
6......	370.26	371.06	373.06	372.66	371.06	371.06	370.36	370.06	370.06	370.06	370.16	370.96
7......	370.26	371.06	373.26	372.56	370.96	371.06	370.26	370.06	370.06	370.06	370.16	370.96
8......	370.26	371.06	373.46	372.56	370.96	371.06	370.16	370.06	370.06	370.06	370.16	370.96
9......	370.26	371.06	373.66	372.46	370.96	371.16	370.16	370.06	370.06	370.06	370.16	370.96
10......	370.26	371.06	373.66	372.36	370.96	371.16	370.06	370.06	370.06	370.06	370.26	370.86
11......	370.26	370.96	373.66	372.36	370.96	371.16	370.06	370.06	370.06	370.06	370.26	370.86
12......	370.26	370.96	373.66	372.26	370.96	371.06	370.06	370.06	370.06	370.06	370.26	370.86
13......	370.26	370.96	373.56	372.16	370.96	370.96	370.06	370.06	370.06	370.06	370.36	370.86
14......	370.26	370.96	373.46	372.16	370.86	370.96	370.06	370.06	370.06	370.06	370.36	370.86
15......	370.26	370.96	373.46	372.06	370.86	370.96	370.06	370.06	370.06	370.06	370.46	370.86
16......	370.26	370.86	373.16	371.96	370.86	370.96	370.06	370.06	370.06	370.06	370.56	370.86
17......	370.26	370.86	373.16	371.96	370.76	370.96	370.06	370.06	370.06	370.06	370.56	370.86
18......	370.26	370.86	372.96	371.86	370.76	370.96	370.06	370.06	370.06	370.06	370.66	370.86
19.....	370.36	370.86	372.86	371.76	370.76	370.86	370.06	370.06	370.06	370.06	370.66	370.86
20.....	370.36	370.86	372.86	371.66	370.86	370.86	370.06	370.06	370.06	370.06	370.76	370.86
21.....	370.36	370.86	372.86	371.56	370.86	370.76	370.06	370.06	370.06	370.06	370.86	370.86
22.....	370.46	370.86	372.66	371.56	370.86	370.76	370.06	370.06	370.06	370.06	370.86	370.76
23.....	370.56	370.86	372.66	371.56	370.86	370.66	370.06	370.06	370.06	369.96	370.86	370.76
24.....	370.56	370.86	372.66	371.56	370.96	370.66	370.06	370.06	370.06	370.06	370.96	370.76
25.....	370.76	370.86	372.66	371.56	370.96	370.66	370.06	370.06	370.06	369.96	370.86	370.76
26.....	371.06	370.86	372.76	371.56	370.96	370.56	370.06	369.86	370.06	369.96	370.86	370.76
27.....	371.06	371.06	372.86	371.46	371.06	370.56	370.06	370.06	370.06	369.96	371.06	370.76
28.....	371.06	371.36	372.86	371.46	371.06	370.56	370.06	370.06	370.06	369.96	371.16	370.66
29.....	371.06	......	372.86	371.46	371.06	370.56	370.06	370.06	370.06	369.96	371.06	370.66
30.....	371.06	......	372.86	371.36	371.06	370.56	370.06	370.06	370.06	369.96	371.06	370.66
31.....	371.06	......	372.86	......	371.06	......	370.06	370.06	......	369.96	......	370.66

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Oneida Lake at Sylvan Beach, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	370.30	370.50	371.30	373.10	371.40	371.10	370.50	370.20	370.10	370.20	370.10	371.10
2......	370.30	370.50	372.60	373.00	371.30	371.10	370.50	370.20	370.00	370.00	370.20	371.10
3.....	370.30	370.50	372.90	372.90	371.30	371.10	370.50	370.20	370.00	370.00	370.30	371.10
4......	370.30	370.50	373.10	372.90	371.30	371.00	370.50	370.20	370.00	370.00	370.40	371.00
5.....	370.30	370.50	373.20	372.80	371.30	371.00	370.50	370.20	370.00	370.00	370.60	371.00
6.....	370.30	370.40	373.40	372.70	371.20	371.10	370.50	370.20	370.00	370.00	370.60	370.90
7.....	370.30	370.40	373.60	372.70	371.10	371.20	370.40	370.20	370.10	370.00	370.60	370.80
8.....	370.30	370.30	373.90	372.60	371.10	371.30	370.40	370.20	370.30	370.00	370.50	370.80
9.....	370.30	370.30	373.90	372.50	371.10	371.20	370.40	370.20	370.30	370.00	370.50	370.80
10......	370.30	370.40	374.00	372.40	371.10	371.20	370.40	370.30	370.20	370.00	370.50	370.80
11.....	370.30	370.40	373.80	372.30	371.10	371.10	370.30	370.30	370.20	370.00	370.80	370.80
12.....	370.30	370.40	373.60	372.30	371.10	371.10	370.20	370.30	370.20	370.10	370.90	370.80
13.....	370.30	370.30	373.60	372.30	371.00	371.10	370.20	370.30	370.30	370.20	371.00	370.70
14.....	370.30	370.30	373.50	372.10	371.00	371.00	370.20	370.30	370.20	370.20	371.00	370.70
15.....	370.30	370.30	373.50	372.10	370.90	371.00	370.10	370.30	370.20	370.20	371.20	370.70
16.....	370.30	370.30	373.50	372.00	370.90	371.00	370.10	370.30	370.20	370.20	371.30	370.80
17.....	370.30	370.30	373.10	372.00	370.90	371.00	370.10	370.30	370.20	370.20	371.30	370.70
18.....	370.30	370.30	373.10	371.90	370.90	371.00	370.10	370.30	370.20	370.20	371.40	370.70
19.....	370.40	370.30	373.00	371.70	370.90	371.00	370.10	370.20	370.20	370.30	371.40	370.70
20.....	370.40	370.30	372.90	371.70	370.90	370.90	370.10	370.20	370.20	370.30	371.40	370.70
21.....	370.50	370.30	372.90	371.70	370.90	370.90	370.10	370.20	370.20	370.30	371.30	370.70
22.....	370.50	370.40	372.90	371.60	370.90	370.80	370.00	370.20	370.20	370.30	371.30	370.70
23.....	370.50	370.40	372.90	371.50	370.90	370.80	370.00	370.20	370.20	370.20	371.20	370.70
24.....	370.50	370.40	373.05	371.40	371.00	370.80	370.00	370.20	370.20	370.10	371.20	370.60
25.....	370.60	370.50	373.05	371.40	371.10	370.70	370.10	370.30	370.20	370.10	371.10	370.60
26.....	370.60	370.50	373.10	371.40	371.10	370.60	370.10	370.30	370.20	370.00	371.10	370.50
27.....	370.60	370.60	373.10	371.40	371.20	370.60	370.10	370.30	370.20	370.00	371.10	370.50
28.....	370.50	371.10	373.10	371.30	371.30	370.60	370.20	370.20	370.20	370.00	371.10	370.50
29.....	370.50	......	373.10	371.20	371.30	370.60	370.20	370.20	370.20	370.00	371.10	370.60
30.....	370.50	......	373.10	371.50	371.20	370.60	370.20	370.20	370.10	370.00	371.10	370.60
31.....	370.50	......	373.10	......	371.20	......	370.30	370.10	......	370.00	......	370.80

ONEIDA RIVER AT CAUGHDENOY, N. Y.

A masonry dam was completed across the Oneida river at Caughdenoy during the summer of 1909. This dam has a substantially level crest 415 feet in length. The crest is at elevation 369.4 and has an ogee cross-section with a slope, or batter, on the up-stream portion of the crest of 1 foot rise in 2 feet horizontal width. The down-stream portion of the crest is rounded with a radius of 3.24 feet.

The gage is located about 150 feet up-stream from the dam, on the right-hand side of the stream. The channel at this point is about 350 feet in width, average bottom elevation being 365.0. The discharge from the dam has been calculated from United States Geological Survey experiments on an ogee cross-section similar in form, and an allowance has been made for velocity of approach. During the summer season and also to some extent during the winter season water is diverted past the left-hand end of the dam through the Caughdenoy lock. An estimate of the amount of diversion has been made and included in the calculated discharge of the river.

Mean Daily Discharge, Second-feet, of Oneida River at Caughdenoy, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	2,730	5,122	5,678	4,943	2,102	1,806	862	388	264	......	289	1,868
2	2,456	5,122	6,900	4,760	2,051	1,596	845	388	388	289	325	1,747
3	2,730	4,760	7,945	4,907	2,127	1,376	810	362	325	442	388	1,747
4	2,730	4,760	8,866	4,907	2,000	1,706	776	388	325	337	528	1,747
5	2,730	4,760	9,112	4,871	1,878	1,878	793	456	388	415	456	1,747
6	2,730	5,122	10,136	4,907	1,878	1,624	706	388	456	617	415	1,696
7	3,089	5,122	10,619	4,604	1,830	1,706	671	325	......	337	993	1,641
8	2,730	5,122	10,619	4,174	2,000	1,706	635	325	388	428	810	1,696
9	2,730	5,488	10,860	4,041	1,706	1,878	600	337	325	289	1,030	1,477
10	2,730	5,122	10,860	3,653	1,569	2,000	564	289	388	325	810	1,260
11	2,730	5,122	10,860	3,846	1,569	2,127	......	456	......	289	845	1,260
12	3,089	5,122	10,860	3,590	1,569	1,951	325	......	......	325	899	1,219
13	3,089	5,122	10,860	3,526	1,487	1,830	264	......	456	315	706	1,302
14	3,089	4,760	10,377	3,309	1,487	1,757	......	496	456	325	671	1,260
15	3,089	4,376	9,894	3,400	1,487	1,706	456	469	456	325	741	1,219
16	3,089	4,376	9,894	3,526	1,439	1,624	388	415	388	313	1,229	1,219
17	3,089	4,376	9,358	3,278	1,487	1,596	456	337	388	325	1,542	1,159
18	3,400	4,760	9,358	2,942	1,069	1,542	388	313	388	325	1,229	1,159
19	3,089	4,760	9,358	2,647	671	1,439	......	388	388	313	1,397	1,020
20	3,089	4,760	9,358	2,620	1,376	1,376	388	456	325	325	1,542	1,059
21	3,089	5,122	9,358	2,647	1,229	1,376	388	456	325	242	1,757	1,059
22	4,041	5,122	8,866	2,647	1,149	1,376	362	456	325	289	1,757	1,059
23	4,041	5,122	8,866	2,647	1,878	1,376	456	456	264	......	1,706	1,179
24	4,376	4,760	8,866	2,647	1,706	1,189	456	442	617	52	1,757	1,139
25	4,376	4,760	8,866	2,620	1,878	1,189	......	496	374	264	1,706	1,139
26	5,122	4,760	8,866	2,510	1,854	1,069	456	325	337	120	1,757	1,219
27	5,488	4,760	9,358	1,990	1,830	974	362	264	428	161	1,757	1,059
28	5,122	5,488	8,866	1,941	1,878	918	362	264	242	242	1,878	1,099
29	5,122	......	4,907	1,747	1,951	881	388	325	325	264	1,951	1,099
30	5,122	......	4,978	1,586	1,878	845	456	388	456	242	1,902	1,302
31	5,122	......	4,907	......	1,757	......	388	388	......	289	......	1,344
Mean	3,524	4,747	8,983	3,381	1,670	1,514	519	387	377	304	1,159	1,329

Monthly Discharge of Oneida River at Caughdenoy, N. Y.

[Drainage area, 1,377 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
January	5,488	2,730	3,524	2.559	2.950
February	5,488	4,376	4,747	3.447	3.590
March	10,860	4,907	8,983	6.524	7.521
April	4,943	1,586	3,381	2.455	2.739
May	2,127	671	1,670	1.213	1.399
June	2,127	845	1,514	1.099	1.226
July	862	264	519	0.377	0.435
August	496	264	387	0.281	0.324
September	617	242	377	0.274	0.306
October	617	52	304	0.221	0.255
November	1,951	289	1,159	0.842	0.939
December	1,868	1,020	1,329	0.965	1.112

CHITTENANGO CREEK DRAINAGE BASIN.

DESCRIPTION.

Chittenango creek is the principal tributary of Oneida lake from the south. It comprises three main branches: Butternut creek, Limestone creek and Chittenango creek proper. The three branches join near North Manlius. Above the junction of Butternut creek, Chittenango creek flows through an irregular dumbbell-shaped area extending in a northwest and southeast direction. This area lies chiefly in the dissected, hilly region south of the line of the New York Central railroad. The length of the basin is about 22 miles. Its width in the upper portion is 9 miles; in the middle portion, 4 miles; in the lower portion, 7 miles. The drainage basin is deeply rolling, mostly cleared and has a heavy, impervious soil with extensive sodded-meadow areas. The soil is underlaid by shale rock, often outcropping, and affording numerous springs. The stream tributaries are somewhat sparse. Marsh and swamp areas are very limited, with the exception of the Nelson swamp, about two square miles in area.

There were formerly several water-powers in use in the deep narrow valley between Chittenango falls and Chittenango. The outflow from Cazenovia lake is regulated and there is also a reservoir at Erieville. These reservoirs are used to supply the summit level of the Erie canal. The capacities of these reservoirs are given as follows in New York State Barge Canal Report for 1901, page 663:

Erieville Reservoir.

Storage capacity	318,424 cubic feet
Tributary drainage area..................	5.4 square miles
Water-surface	340 acres

Cazenovia Lake.

Tributary drainage area................	8.7 square miles
Storage capacity	206,997 cubic feet
Water-surface	1.7 square miles

The head of the stream is near Erieville reservoir, which is formed by a dam crossing a small stream valley, formerly tributary to Chenango river through Eaton brook. Results of gagings of Chittenango creek at Bridgeport, where the stream debouches into Oneida lake, may be found in the report of the State Engineer and Surveyor for 1902, supplement, pages 57–61. Cazenovia lake is located 10 miles below Erieville reservoir, which is at the head of the stream at elevation 1,190. From its outlet to the foot of the plateau at Erie canal crossing the stream descends

770 feet, the distance, following the general trend of the valley, being 11 miles. At Chittenango falls there occurs a precipitous descent of about 100 feet.

CHITTENANGO CREEK AT CHITTENANGO, N. Y.

A current-meter gaging station was established at Main street highway bridge in Chittenango village, May 22, 1901, by R. E. Horton, for the U. S. Geological Survey, by which it was maintained until July 9, 1905, when it was transferred to the care of this Department. Current-meter measurements have been taken and rating table made, from which the accompanying tables have been computed.

The stream at this point is entrained between parallel walls, affording a channel 50 feet wide, over which the bridge passes at a single span. The bridge stands at an angle to the thread of the stream, and has a span between abutments of 57 feet. The gage board is secured in a vertical position to the right abutment on the up-stream side, and reads decimally from 0 to 8 feet. The stage of the stream is observed twice daily by the gage-reader, Bessie M. Kellogg. The bench-mark is on the up-stream corner of the coping of the right-hand bridge abutment.

Elevation, bench-mark	458.39
Elevation, gage zero	450.16

The gaging station is one-half mile above the State dam, diverting water for the supply of the summit level of Erie canal. The freshet of December 15, 1901, changed the cross-section of the stream at the gaging station. Separate rating curves have been prepared for the periods preceding and following that date.

Current-meter Discharge Measurements of Chittenango Creek at Chittenango, N. Y.

DATE.	Hydrographer.	Gage Reading.			Meter No.	Lateral interval.	Submergence depth.	Area flowing.	Total width.	Computed discharge.	Velocity correction factor.	Corrected discharge.
		Beginning.	Ending.	Mean.								
						Feet.		*Square feet.*	*Feet.*	*Second-feet.*		*Second-feet.*
1910.												
Aug. 30	A. R. Patchke....	1.2	1.2	1.2	559	5	0.6	63.6	56.0	48.2	0.866	41.7
Sept. 21	A. T. Clark......	1.2	1.2	1.2	559	5	0.6	62.8	56.0	43.1	0.866	37.3

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Chittenango Creek at Chittenango, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec
1910.												
1.....	451.91	452.01	453.91	451.76	451.61	451.51	451.21	451.41	451.61	451.51	451.51	452.71
2.....	451.86	452.01	453.21	451.71	451.66	451.46	451.11	451.51	451.56	451.61	451.56	452.51
3.....	452.01	451.96	453.11	451.76	451.81	451.41	451.26	451.61	451.51	451.56	451.61	452.21
4.....	452.21	451.91	453.11	451.66	451.76	451.41	451.36	451.56	471.61	451.61	451.71	452.01
5.....	452.41	451.86	453.06	451.61	451.86	451.61	451.41	451.46	451.61	451.61	452.16	451.91
6.....	452.51	451.91	453.01	451.66	451.76	451.51	451.36	451.41	451.71	451.56	452.01	451.96
7.....	452.51	451.81	453.81	451.71	451.66	451.76	451.31	451.51	451.61	451.71	452.21	452.01
8.....	452.61	451.71	452.86	451.61	451.56	452.11	451.31	451.51	451.61	451.56	452.11	451.91
9.....	452.71	451.81	452.71	451.56	451.66	451.61	451.41	451.41	451.51	451.56	452.11	452.01
10.....	452.66	452.01	452.51	451.61	451.76	451.51	451.46	451.51	451.56	451.51	452.31	452.11
11.....	452.51	452.11	452.21	451.71	451.81	451.81	451.51	451.41	451.61	451.51	452.81	452.06
12.....	452.61	452.21	452.11	451.66	451.76	451.76	451.41	451.31	451.61	451.61	452.61	452.01
13.....	452.60	452.21	452.21	251.61	451.66	451.56	451.31	451.41	451.51	451.51	452.81	452.01
14.....	452.71	452.16	452.01	451.71	451.61	451.56	451.41	451.51	451.61	451.46	453.01	452.01
15.....	452.51	452.16	451.96	451.61	451.66	451.56	451.51	451.61	451.71	451.41	452.81	452.11
16.....	452.41	451.91	452.06	451.56	451.71	451.61	451.41	451.51	451.81	451.36	452.81	452.01
17.....	452.61	451.81	452.21	451.61	451.61	451.51	451.41	451.51	451.76	451.41	452.76	452.06
18.....	452.81	451.91	452.21	451.56	451.61	451.46	451.51	451.61	451.71	451.46	452.71	452.01
19.....	452.76	452.01	452.26	451.46	451.71	451.41	451.46	451.71	451.31	451.51	452.61	452.01
20.....	452.66	451.91	452.21	451.51	451.91	451.46	451.56	451.61	451.31	451.56	452.81	451.91
21.....	452.51	452.06	452.31	451.56	451.81	451.41	451.41	451.51	451.51	451.41	453.01	452.01
22.....	452.61	452.01	452.36	451.61	451.76	451.36	451.46	451.61	451.31	451.41	452.91	452.11
23.....	452.41	451.91	452.26	451.61	451.71	451.51	451.41	451.61	451.26	451.51	452.91	452.01
24.....	452.21	451.76	452.26	451.61	451.81	451.41	451.46	451.56	451.16	451.56	453.11	451.91
25.....	452.01	451.76	452.31	451.76	452.46	451.41	451.46	451.46	451.16	451.46	453.01	452.11
26.....	452.01	251.71	452.36	451.76	452.41	451.46	451.41	451.56	452.06	451.41	453.11	452.21
27.....	452.01	452.11	452.11	451.61	452.21	451.36	451.51	451.51	452.41	451.41	453.01	452.41
28.....	452.11	453.51	452.01	451.61	452.11	451.26	451.41	451.56	452.36	451.51	453.11	452.51
29.....	452.21	......	451.96	451.61	451.91	451.31	451.36	451.56	451.61	451.56	452.91	452.41
30.....	452.01	......	451.86	451.61	451.71	451.26	451.46	451.41	451.61	451.66	452.96	452.21
31.....	452.06	......	451.81	......	451.51	......	451.51	451.26	......	451.56	......	452.11

Mean Daily Discharge, Second-feet, of Chittenango Creek at Chittenango, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	108	125	940	85	65	55	32	45	65	55	55	335
2.....	100	125	555	78	70	50	28	55	60	65	60	258
3.....	125	115	508	85	92	45	35	65	55	60	65	168
4.....	168	108	508	70	85	45	40	60	65	65	78	125
5.....	225	100	485	65	100	65	45	50	65	65	155	108
6.....	258	108	462	70	85	55	40	45	78	60	125	115
7.....	258	92	880	78	70	85	38	55	65	78	168	125
8.....	295	78	395	65	60	145	38	55	65	60	145	108
9,.....	335	92	335	60	70	65	45	45	55	60	145	125
10.....	315	125	258	65	85	55	50	55	60	55	195	145
11.....	258	145	168	78	92	92	55	45	65	55	375	135
12.....	295	168	145	70	85	85	45	38	65	65	295	125
13.....	315	168	168	65	70	60	38	45	55	55	375	125
14.....	335	155	125	78	65	60	45	55	65	50	462	125
15.....	258	155	115	65	70	60	55	65	78	45	375	145
16.....	225	108	135	60	78	65	45	55	92	40	375	125
17.....	295	92	168	65	65	55	45	55	85	45	355	135
18.....	375	108	168	60	65	50	55	65	78	50	335	125
19.....	355	125	180	50	78	45	50	78	38	55	295	125
20.....	315	108	168	55	108	50	60	65	38	60	375	108
21.....	258	135	195	60	92	45	45	55	55	45	462	125
22.....	295	125	210	65	85	40	50	65	38	45	417	145
23.....	225	108	180	65	78	55	45	65	35	55	417	125
24.....	168	85	180	65	92	45	50	60	30	60	508	108
25.....	125	85	195	85	240	45	50	50	30	50	462	145
26.....	125	78	210	85	225	50	45	60	135	45	508	168
27.....	125	145	145	65	168	40	55	55	225	45	462	225
28.....	145	708	125	65	145	35	45	60	210	55	508	258
29.....	168	......	115	65	108	38	40	60	65	60	417	225
30.....	125	......	100	65	78	35	50	45	65	70	440	168
31.....	135	......	92	......	55	......	55	35	......	60	......	145
Mean...	229	139	278	68	94	57	46	55	73	56	314	152

Monthly Discharge of Chittenango Creek at Chittenango, N. Y.

[Drainage area, 79 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
January	375	100	229	2.899	3.342
February	708	78	139	1.759	1.832
March	940	92	278	3.519	4.057
April	85	50	68	0.861	0.961
May	240	55	94	1.190	1.372
June	145	35	57	0.722	0.806
July	60	28	46	0.582	0.671
August	78	35	55	0.696	0.802
September	225	30	73	0.924	1.031
October	78	40	56	0.709	0.817
November	508	55	314	3.975	4.434
December	335	108	152	1.924	2.218

BUTTERNUT CREEK.

DESCRIPTON.

The head waters of Butternut creek lie at elevation 1,700 feet, near the south line of Onondaga county. This stream drains a narrow basin about 24 miles in length and having an average width of about 3 miles. The stream flows in a southerly direction. Jamesville reservoir is located 14 miles below the source at elevation about 640. North of Erie canal the stream flows out into the flat lands, at elevation about 400, which border Oneida lake for a width of several miles. Butternut creek is joined by Limestone creek near North Manlius at a point about 1½ miles above its junction with Chittenango creek. Erie canal crosses the stream 4½ miles below Jamesville. Above Erie canal crossing the slopes are steep and the tributaries are mostly short laterals. Jamesville reservoir has a capacity of 170,000,000 cubic feet. The water-surface area is 252 acres. At a distance of 2.35 miles below Jamesville is a dam which diverts part of the stream to the Orrville feeder. This feeder is 2.25 miles in length.

BUTTERNUT CREEK NEAR JAMESVILLE, N. Y.

A gaging station was established on Butternut creek at the first bridge above the head of the Orrville feeder, July 25, 1907, by Robert E. Horton, for this Department. The gage is located about 2 miles below Jamesville, and measurements at this point will show the supply to the canal available from Jamesville reservoir and the Orrville feeder. A box-and-chain gage is bolted to the hand-rail of the bridge on the up-stream side. The gage scale reads from zero to 7.5 feet, and the length of the chain is 13.00 feet. The current-meter measurements are made from the down-stream side of the bridge, using the face of the right-hand abutments as an initial point. The bridge is subdivided at two-foot intervals and the span is 40 feet. The gage is read at 7 A. M. and 6 P. M. by Marie Brandt Brown.

Mean Daily Gage Height, in Feet, of Butternut Creek near Jamesville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	1.35	1.50	1.85	1.70	1.40	1.25	1.50	1.25	1.30	1.25	1.25	1.50
2......	1.40	1.50	2.15	1.70	1.45	1.25	1.50	1.30	1.30	1.25	1.25	1.55
3......	1.45	1.50	1.90	1.60	1.40	1.35	1.50	1.25	1.30	1.15	1.35	1.55
4......	1.50	1.50	1.90	1.70	1.40	1.30	1.50	1.25	1.30	1.15	1.45	1.55
5......	1.50	1.45	1.80	1.60	1.40	1.40	1.50	1.30	1.30	1.25	1.40	1.50
6......	1.50	1.40	1.90	1.60	1.40	1.40	1.50	1.30	1.20	1.25	1.45	1.55
7......	1.40	1.40	1.90	1.65	1.40	1.45	1.50	1.30	1.20	1.15	1.45	1.55
8......	1.45	1.40	1.90	1.60	1.45	1.50	1.55	1.30	1.20	1.20	1.55	1.60
9......	1.40	1.45	1.85	1.60	1.50	1.60	1.50	1.35	1.20	1.20	1.55	1.55
10......	1.50	1.50	1.80	1.60	1.50	1.40	1.50	1.40	1.20	1.25	1.55	1.50
11......	1.50	1.45	1.75	1.55	1.45	1.45	1.50	1.35	1.10	1.25	1.45	1.55
12......	1.50	1.40	1.80	1.50	1.50	1.50	1.45	1.35	1.15	1.25	1.50	1.55
13......	1.50	1.40	2.05	1.50	1.50	1.50	1.40	1.30	1.20	1.20	1.40	1.60
14......	1.40	1.30	2.20	1.50	1.45	1.45	1.40	1.30	1.10	1.20	1.35	1.60
15......	1.40	1.30	2.10	1.55	2.15	1.40	1.40	1.25	1.15	1.30	1.35	1.55
16......	1.20	1.40	2.00	1.50	2.25	1.40	1.40	1.20	1.10	1.35	1.35	1.55
17......	1.20	1.40	2.00	1.50	2.15	1.45	1.40	1.20	1.15	1.35	1.55	1.60
18......	1.00	1.40	1.80	1.55	2.10	1.45	1.35	1.15	1.20	1.40	1.45	1.70
19......	1.20	1.40	1.75	1.50	2.00	1.45	1.30	1.10	1.20	1.35	1.40	1.75
20......	1.35	1.40	2.00	1.60	2.00	1.50	1.30	1.10	1.15	1.30	1.35	1.80
21......	1.50	1.45	2.30	1.55	2.00	1.50	1.25	1.10	1.20	1.25	1.35	1.95
22......	1.80	1.55	2.15	1.55	2.20	1.50	1.20	1.10	1.20	1.25	1.35	1.95
23......	1.55	1.85	2.10	1.60	2.20	1.50	1.20	1.10	1.25	1.35	1.40	2.00
24......	1.50	1.85	2.20	1.70	2.20	1.50	1.25	1.15	1.25	1.30	1.40	2.05
25......	1.50	1.55	2.10	1.80	2.30	1.40	1.30	1.20	1.20	1.30	1.45	2.05
26......	1.50	1.50	2.30	1.80	2.30	1.50	1.30	1.20	1.20	1.30	1.45	3.15
27......	1.50	1.50	2.30	1.70	2.30	1.50	1.30	1.15	1.20	1.35	1.45	3.15
28......	1.40	1.60	2.20	1.70	2.40	1.50	1.30	1.20	1.30	1.30	1.45	3.15
29......	1.40	......	1.80	1.65	2.35	1.50	1.25	1.20	1.25	1.25	1.35	3.40
30......	1.40	......	1.70	1.60	2.35	1.50	1.20	1.20	1.35	1.25	1.35	3.35
31......	1.40	......	1.75	......	1.20	......	1.20	1.20	......	1.20	......	3.45

Current-meter Discharge Measurements of Butternut Creek near Jamesville, N. Y.

DATE.	Hydrographer.	GAGE READING.			Meter No.	Lateral interval.	Submergence depth.	Area flowing.	Total area.	Total width.	Computed discharge.
		Beginning.	Ending.	Mean.							
1907.						*Ft.*		*Sq. ft.*	*Sq. ft.*	*Ft.*	*Sec.-ft.*
July 25	Weeks and Quinn	3.55	3.40	3.48	462	2	6/10	......	111.5	40	406
July 25	Weeks and Quinn	3.00	3.00	3.00	462	2	6/10	......	89.11	40	283
July 26	Weeks and Quinn	2.45	2.45	2.45	462	2	6/10	......	70.7	40	178
July 26	Weeks and Quinn	2.45	2.45	2.45	462	2	6/10	......	70.7	40	189
Aug. 14	E. F. Weeks	1.75	1.80	1.78	462	2	6/10	......	44.8	38	65.6
Aug. 16	E. C. Niles	1.75	1.80	1.78	360	2	6/10	......	45.2	39	74
Aug. 20	E. C. Niles	1.40	1.40	1.40	360	2	6/10	......	30.6	38	31.6
Sept. 18	E. C. Niles	1.65	1.65	1.65	360	2	6/10	......	40.0	39	46.8
1908.											
April 23	E. C. Niles	2.25	2.25	2.25	360	2	6/10	......	58.9	40	120
May 14	E. C. Niles	1.65	1.65	1.65	360	2	6/10	......	35.1	40	63.9
June 3	E. C. Niles	1.60	1.60	1.60	360	2	6/10	......	33.4	40	48.9
July 18	A. R. Patchke	1.26	1.26	1.26	462	2	6/10	......	21.0	37	23.7
Sept. 9	A. R. Patchke	0.96	0.96	0.96	360	2	6/10	......	14.0	23.5	12.6
Sept. 17	A. T. Clark	1.40	1.40	1.40	764	2	6/10	......	31.2	37.3	39.8
Oct. 2	A. R. Patchke	1.45	1.28	1.36	360	2	6/10	......	25.3	37.5	31.5
1909.											
Feb. 11	Gehring and Clark	1.70	1.60	1.65	559	2	6/10	......	39.4	38	63.0
May 13	A. R. Patchke	1.94	1.94	1.94	559	2	6/10	......	51.3	40	104.1
July 29	E. C. Niles	1.35	1.35	1.35	559	2	6/10	......	28.3	37	33.1
Aug. 26	E. C. Niles	1.60	1.60	1.60	559	2	6/10	......	37.7	38	58.2
Oct. 27	A. R. Patchke	1.33	1.33	1.33	360	2	6/10	......	27.6	37.5	36.5
1910.											
June 13	H. V. Button	1.50	1.50	1.50	559	2	6/10	......	27.8	38	49.2
Aug. 30	A. R. Patchke	1.15	1.15	1.15	559	2	6/10	19.4	......	24	15.6
Sept. 24	A. T. Clark	1.30	1.30	1.30	559	2	6/10	......	26.1	36.7	36.5

Mean Daily Discharge, Second-feet, of Butternut Creek near Jamesville, N. Y.

DAY.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.						
1	......	94	*42	38	51	*76
2	......	150	88	38	56	71
3	......	119	42	42	*51	66
4	......	*42	56	46	61	66
5	......	46	56	42	56	56
6	......	22	61	*38	66	61
7	......	34	56	71	410	66
8	......	30	*42	82	304	*56
9	......	38	46	61	292	56
10	......	34	61	61	*112	56
11	......	*42	51	56	134	76
12	......	34	56	51	126	71
13	......	38	46	*82	119	88
14	......	61	38	61	100	82
15	......	71	*38	56	100	*76
16	......	56	56	76	94	66
17	......	61	51	51	*76	66
18	......	*42	66	46	100	66
19	......	71	66	42	76	56
20	......	56	82	*51	71	56
21	......	61	51	46	61	56
22	......	56	*66	38	56	*56
23	......	51	82	42	56	236
24	......	56	100	42	*66	226
25	336	*42	46	46	71	216
26	153	51	56	38	76	226
27	96	66	66	*38	71	236
28	*82	56	82	42	66	216
29	66	51	*61	42	76	*216
30	82	76	46	38	66	196
31	56	66	......	38	......	186
Mean	......	57.2	58.5	49.7	104	110

* Sunday.

Mean Daily Discharge, Second-feet, of Butternut Creek near Jamesville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
1......	76	56	*150	167	226	66	56	38	30	34	*12	12
2......	71	*46	*a*	158	216	56	56	*46	38	30	12	82
3......	66	42	*a*	150	*206	46	56	46	38	3	12	66
4......	76	38	*a*	134	196	46	56	46	42	*4	12	66
5......	*66	38	425	*142	158	46	*56	46	42	5	12	46
6......	66	38	*a*	150	176	12	56	46	*34	4	12	*46
7......	56	38	*a*	142	196	*12	56	42	34	4	9	2
8......	56	38	**a*	134	226	12	56	38	26	5	*3	2
9......	61	*34	*a*	112	304	28	56	*38	3	6	8	3
10......	61	34	*a*	142	*269	28	56	38	9	6	8	3
11......	56	38	*a*	103	216	28	56	38	12	*12	9	6
12......	*56	42	620	*112	196	28	*46	30	12	12	9	12
13......	56	258	*a*	100	106	26	46	30	*12	12	9	*8
14......	66	520	*a*	106	150	*12	38	30	12	12	12	8
15......	56	*a*	**a*	112	134	30	38	30	12	12	*9	12
16......	46	**a*	*a*	106	100	22	30	*30	12	12	9	12
17......	46	543	*a*	185	*94	22	38	30	12	12	9	12
18......	38	520	*a*	158	94	22	56	30	12	*12	9	8
19......	*46	440	*a*	*196	88	13	*56	30	12	12	12	8
20......	46	425	*a*	158	71	22	56	30	*12	12	12	*12
21......	56	459	*a*	126	88	*30	46	30	12	9	12	12
22......	61	440	*317	150	88	56	46	30	12	9	*12	12
23......	71	**a*	176	134	82	56	66	*22	12	12	9	12
24......	94	*a*	167	126	*71	56	66	22	12	12	8	19
25......	76	566	196	126	65	56	56	22	12	*12	8	22
26......	*66	440	247	*150	103	56	*46	22	9	12	8	22
27......	56	280	258	186	71	46	46	12	*9	9	8	*13
28......	56	304	258	176	61	*46	46	12	12	12	8	6
29......	51	304	*216	158	71	30	38	12	12	12	*8	6
30......	56	......	193	158	82	22	38	*12	12	9	8	6
31......	56	......	158	......	*76	......	38	12	......	9	......	6
Mean...	60.2	......	......	142	133	31.4	50.1	30.3	17.7	10.9	9.77	18.1

a Gage height exceeds limit of rating curve. * Sunday.

Mean Daily Discharge, Second-feet, of Butternut Creek near Jamesville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.*a*	July.*a*	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1......	12	12	236	330	196	3	2	*12	100	13	9	8
2......	12	12	158	384	*158	3	2	12	100	12	12	8
3......	*8	38	134	425	158	3	2	12	100	*13	12	6
4......	8	38	100	*317	158	2	*2	12	100	19	12	6
5......	6	46	100	344	119	2	2	16	*100	19	12	*5
6......	6	38	100	371	112	*3	2	16	112	16	6	5
7......	6	*30	*112	371	126	2	2	16	126	12	*6	5
8......	6	12	142	371	158	2	2	*12	106	12	8	4
9......	46	12	158	317	*134	3	2	12	100	12	8	4
10......	*46	8	150	280	112	3	2	12	100	*12	8	3
11......	38	8	176	*167	119	3	*2	12	100	12	8	3
12......	38	8	216	71	119	3	2	12	*88	30	12	*3
13......	46	9	258	56	100	*3	2	16	82	22	9	4
14......	30	*12	*119	51	88	2	2	16	82	22	*12	8
15......	30	8	119	51	88	2	2	*12	82	26	16	6
16......	22	6	100	56	*76	2	2	12	94	22	22	6
17......	*12	6	100	46	88	2	2	12	100	*19	16	6
18......	9	8	119	*94	94	2	*2	13	100	16	16	6
19......	8	71	167	94	88	2	3	22	*12	16	12	*8
20......	22	88	258	82	88	*2	12	22	51	12	12	9
21......	34	*280	*258	76	71	2	12	22	34	13	*12	13
22......	38	317	100	66	71	2	12	*22	19	13	12	16
23......	46	330	106	51	*3	2	16	22	16	12	12	30
24......	*38	410	100	82	3	2	26	26	16	*12	12	30
25......	30	358	126	*88	4	2	*30	30	16	6	12	42
26......	16	344	134	100	4	2	26	46	*16	6	8	*26
27......	16	280	304	100	5	*2	22	34	16	6	8	22
28......	13	*280	*280	119	6	2	22	30	13	5	*12	22
29......	12	......	280	226	6	2	16	*30	13	5	12	22
30......	12	......	384	236	*3	2	16	30	13	5	8	22
31......	*12	......	410	......	3	......	22	30	......	*4	......	30
Mean ..	21.9	110	178	181	82.5	2.30	8.74	19.5	66.9	13.7	11.2	12.5

* Sunday. *a* Low water flow is roughly approximate.

Mean Daily Discharge, Second-feet, of Butternut Creek at Jamesville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	34	46	82	66	*38	26	46	26	30	26	26	46
2......	*38	46	119	66	42	26	46	30	30	*26	26	51
3......	42	46	88	*56	38	34	*46	26	30	19	34	51
4......	46	46	88	66	38	30	46	26	*30	19	42	*51
5......	46	42	76	56	38	*38	46	30	30	26	38	46
6......	46	*38	*88	56	38	38	46	30	22	26	*42	51
7......	38	38	88	61	38	42	46	*30	22	19	42	51
8......	42	38	88	56	*42	46	51	30	22	22	51	56
9......	*38	42	82	56	46	56	46	34	22	*22	51	51
10......	46	46	76	*56	46	38	*46	38	22	26	51	46
11......	46	42	71	51	42	42	46	34	*16	26	42	*51
12......	46	38	76	46	46	*46	42	34	19	26	46	51
13......	46	*38	*106	46	46	46	38	30	22	22	*38	56
14......	38	30	126	46	42	42	38	*30	16	22	34	56
15......	38	30	112	51	*119	38	38	26	19	30	34	51
16......	*22	38	100	46	134	38	38	22	16	*34	34	51
17......	22	38	100	*46	119	42	*38	22	19	34	51	56
18......	12	38	76	51	112	42	34	19	*22	38	42	*66
19......	22	38	71	46	100	*42	30	16	22	34	38	71
20......	34	*38	*100	56	100	46	30	16	19	30	*34	76
21......	46	42	142	51	100	46	26	*16	22	26	34	94
22......	76	51	119	51	*126	46	22	16	22	26	34	94
23......	*51	82	112	56	126	46	22	16	26	*34	38	100
24......	46	82	126	*66	126	46	*26	19	26	30	38	106
25......	46	51	112	76	142	38	30	22	*22	30	42	*106
26......	46	46	142	76	142	*46	30	22	22	30	42	317
27......	46	*46	*142	66	142	46	30	19	22	34	*42	317
28......	38	56	126	66	158	46	30	*22	30	30	42	317
29......	38	......	76	61	*150	46	26	22	26	26	34	384
30......	*38	......	66	56	150	46	22	22	34	*26	34	371
31......	38	......	71	......	22	......	*22	22	......	22	......	397
Mean...	40.4	44.7	98.3	56.8	85.4	41.7	36.2	24.7	23.4	27.1	39.2	119

* Sunday.

Monthly Discharge of Butternut Creek near Jamesville, N. Y.

[Drainage area, 53 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1907.					
August	150	22	57.2	1.08	1.24
September	100	38	58.5	1.10	1.23
October	82	38	49.7	0.938	1.08
November	410	51	104	1.96	2.19
December	236	56	110	2.08	2.40
1908.					
January	94	38	60.2	1.14	1.31
April	196	100	142	2.68	2.99
May	304	61	138	2.60	3.00
June	66	12	34.4	0.649	0.724
July	56	30	50.1	0.945	1.09
August	46	12	30.3	0.572	0.660
September	42	3	17.7	0.334	0.373
October	34	3	10.9	0.206	0.238
November	12	8	9.77	0.184	0.205
December	82	2	18.1	0.342	0.394

Monthly Discharge of Butternut Creek near Jamesville, N. Y.
[Drainage area, 53 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1909.					
January	46	6	21.9	0.413	0.476
February	410	6	110	2.08	2.17
March	410	100	178	3.36	3.87
April	425	46	181	3.42	3.82
May	196	3	82.5	1.56	1.80
June	3	2	2.30	0.043	0.048
July	30	2	8.74	0.165	0.190
August	46	12	19.5	0.368	0.424
September	126	12	66.9	1.26	1.41
October	30	4	13.7	0.258	0.297
November	22	6	11.2	0.211	0.235
December	42	3	12.5	0.236	0.272
1910.					
January	76	12	40.4	0.762	0.878
February	82	30	44.7	0.843	0.878
March	142	66	98.3	1.85	2.13
April	76	46	56.8	1.07	1.19
May	158	22	85.4	1.61	1.86
June	56	26	41.7	0.787	0.878
July	51	22	36.2	0.683	0.787
August	38	16	24.7	0.466	0.537
September	34	16	23.4	0.442	0.493
October	38	19	27.1	0.511	0.589
November	51	26	39.2	0.740	0.826
December	397	46	119	2.25	2.59

LIMESTONE CREEK.

DESCRIPTION.

The natural source of Limestone creek is on the slope of Tinselor hills near Erieville, Madison county, N. Y. In the construction of the Chenango canal, Tioughnioga creek was diverted and DeRuyter reservoir receives the drainage tributary to this stream above the point of diversion and also that from additional area tributary to Limestone creek, making a total area above the reservoir outlet of 18.8 square miles. The reservoir has a capacity of 504,468,000 cubic feet, and a surface area of about 1.0 square mile. The stored waters are discharged through Limestone creek during the canal navigation season. Water is diverted to a feeder by a dam below Manlius. The feeder is used as a water-power canal to supply several mills at Fayetteville, at which place there is a second diverting dam. The feeder enters Erie canal 1.2 miles below Fayetteville. Power is also developed on Limestone creek at Manlius and Edwards Falls. The head waters of Limestone creek are at elevation 1,900 feet. DeRuyter reservoir is at elevation 1,286 feet. The fall of the stream is rapid in the first three miles below the reservoir, the elevation at the lower end of this reach at Delphi being 900 feet. From Delphi to Buellville the creek follows a winding course over a flat valley bottom averaging about one-half mile in width. The descent in 8 miles between these points is 150 feet. Between Buellville and Manlius, a distance of two miles, a fall of 200 feet occurs. This is mostly concentrated at Edwards Falls. The west or Watervale branch of Limestone creek joins the main stream below Manlius. The precipitous descent of about 100 feet in a short distance occurs at this branch at stone quarry falls. The drainage basin is shown on the Syracuse, Tully, Chittenango and Cazenovia sheets of the United States Geological Survey topographic map.

LIMESTONE CREEK AT FAYETTEVILLE, N. Y.

This gaging station, which is located above the State dam at the head of the Erie canal feeder in Fayetteville, was established August 27, 1905, by C. A. Poole.

The gage is a vertical board, graduated in feet and tenths, and is secured to retaining wall on south side of gates at entrance to feeder, about 55 feet above crest of dam. The elevation of zero of gage is 429.53. The elevation of bench-mark on east end of north retaining wall of feeder, 42 feet east of gates, is 434.74. Observations are taken twice daily by C. B. Dunlop.

The dam is of masonry and in good condition, having been rebuilt in 1897. It is of trapezoidal shape with an approach slope of 1 to 6 and vertical down-stream face. The length of crest is 99.1 feet at an average elevation of 431.18.

The flow in the feeder is controlled by gateways at entrance. There are four openings in the bulkhead, which are regulated by means of drop planks.

A gage was temporarily maintained in the canal feeder at Fayetteville, but the fluctuation was so slight that it has been discontinued.

Water is also diverted through the cement mill on east side of creek. Current-meter measurements were formerly made in the raceway to mill, and in the canal feeder. The freshet discharge of the stream can be determined at this site, but a separate gaging station was established at Manlius in July, 1907, to determine the low-water flow.

Computations of discharge are not at present available.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Limestone Creek Feeder at Fayetteville, N. Y.

DAY.	Jan.[a]	Feb.[a]	Mar.[a]	April.[a]	May.[a]	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.[a]
1910.												
1	......	......	......	......	......	432.74	432.64	432.84	433.04	432.89	432.84	......
2	......	......	......	......	......	432.74	432.79	432.94	432.94	432.94	432.89	......
3	......	......	......	......	......	432.79	432.89	432.94	432.94	432.84	432.94	......
4	......	......	......	......	......	432.84	432.94	432.94	432.99	432.79	432.94	......
5	......	......	......	......	......	432.99	432.89	432.94	432.99	432.74	432.99	......
6	......	......	......	......	......	432.99	432.84	432.79	433.14	432.84	433.04	......
7	......	......	......	......	......	433.04	432.94	432.69	432.99	432.94	432.94	......
8	......	......	......	......	......	432.94	432.79	432.69	432.94	432.89	432.89	......
9	......	......	......	......	......	432.84	432.69	432.74	432.99	432.79	432.84	......
10	......	......	......	......	......	432.89	432.69	432.84	432.94	432.74	432.99	......
11	......	......	......	......	......	432.94	432.84	432.94	432.94	432.79	432.94	......
12	......	......	......	......	......	433.04	432.74	432.94	432.94	432.74	432.89	......
13	......	......	......	......	......	432.94	432.79	432.89	432.84	432.74	432.94	......
14	......	......	......	......	......	432.79	432.84	432.79	432.94	432.69	432.94	......
15	......	......	......	......	......	432.84	432.84	432.94	432.94	432.74	432.89	......
16	......	......	......	......	430.74	432.84	432.84	432.94	432.89	432.64	[a]	......
17	......	......	......	......	431.14	322.89	432.79	432.94	432.94	432.74	[a]	......
18	......	......	......	......	431.49	432.94	432.74	432.89	432.89	432.79	[a]	......
19	......	......	......	......	432.44	432.89	432.84	433.04	432.89	432.84	[a]	......
20	......	......	......	......	432.59	432.84	432.94	432.94	432.94	432.94	[a]	......
21	......	......	......	......	432.94	432.84	432.94	432.94	432.94	432.94	[a]	......
22	......	......	......	......	432.84	432.94	432.94	432.94	432.84	432.94	[a]	......
23	......	......	......	......	432.84	432.89	432.94	433.04	432.79	432.79	[a]	......
24	......	......	......	......	432.84	432.84	432.79	432.99	432.89	432.89	[a]	......
25	......	......	......	......	432.94	432.84	432.79	432.89	432.99	432.94	[a]	......
26	......	......	......	......	432.84	432.74	432.94	432.99	433.09	432.84	[a]	......
27	......	......	......	......	432.84	432.69	432.84	432.94	433.04	432.89	[a]	......
28	......	......	......	......	432.79	432.74	432.94	432.99	432.94	432.94	[a]	......
29	......	......	......	......	432.84	432.74	432.94	432.94	432.94	432.94	[a]	......
30	......	......	......	......	432.84	432.64	432.94	432.89	432.99	432.94	[a]	......
31	......	......	......	......	432.79	......	432.79	432.94	......	432.89	......	......

[a] Navigation closed; record discontinued.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Limestone Creek above Dam at Fayetteville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	431.63	432.55	433.03	431.53	431.03	431.48	430.53	431.13	431.43	431.43	431.28	432.43
2	431.63	432.53	433.18	431.53	430.48	431.38	430.73	431.38	431.23	431.28	431.23	432.38
3	431.63	432.58	432.83	431.43	430.38	431.28	430.78	431.23	431.38	431.23	431.28	432.43
4	431.63	432.63	432.73	431.43	430.28	431.33	430.73	431.38	431.28	431.18	431.33	432.28
5	431.63	432.63	432.53	431.38	430.33	431.58	430.93	431.33	431.28	431.08	431.58	432.23
6	431.63	432.63	432.68	431.48	430.33	431.88	431.03	431.18	431.58	431.13	431.68	432.28
7	431.63	432.63	432.73	431.53	430.53	431.68	430.68	431.18	431.43	431.33	431.58	432.23
8	431.63	432.63	432.68	431.48	430.58	431.58	430.53	431.23	431.28	431.28	431.53	432.28
9	431.63	432.63	432.63	431.43	430.43	431.53	430.48	431.28	431.48	431.28	431.48	432.33
10	431.63	432.63	432.63	431.33	430.58	431.38	430.53	431.08	431.28	431.13	431.78	432.18
11	431.63	432.63	432.58	431.33	430.48	431.38	430.58	431.38	431.18	430.98	431.68	432.28
12	431.63	432.63	432.53	431.48	429.53	431.38	430.53	431.43	431.13	431.08	431.78	432.23
13	431.63	432.63	432.48	431.53	429.53	431.33	430.68	431.33	431.08	431.08	431.83	432.28
14	431.63	432.63	432.53	431.48	429.53	431.33	430.98	431.18	431.18	431.03	431.88	432.38
15	431.63	432.68	432.48	431.33	429.53	431.13	430.78	431.13	431.08	430.98	431.98	432.33
16	431.63	432.78	432.43	431.43	429.53	431.23	430.73	431.08	431.18	430.98	431.88	432.33
17	431.63	432.68	432.28	431.53	429.53	431.38	430.88	431.13	431.13	430.93	431.83	432.33
18	432.13	432.63	432.23	431.53	429.53	431.18	430.83	431.28	431.18	430.88	431.88	432.28
19	432.33	432.63	432.18	431.53	429.53	431.13	430.73	431.68	431.08	431.03	432.08	432.23
20	432.38	432.63	432.13	431.53	433.53	431.23	430.78	431.23	431.23	431.23	432.23	432.28
21	432.48	432.73	432.13	431.58	430.78	431.18	431.03	431.28	431.18	431.28	432.18	432.28
22	433.08	432.63	432.23	431.48	431.43	431.28	431.08	431.33	430.98	431.38	432.23	432.28
23	432.93	432.63	432.08	431.43	431.73	431.03	431.18	431.48	431.08	431.43	432.28	432.28
24	432.53	432.63	431.98	431.38	431.73	430.98	431.03	431.23	431.23	431.48	432.43	432.43
25	432.38	432.63	431.93	431.38	432.08	430.88	431.13	431.08	431.48	431.53	432.28	432.28
26	432.43	432.63	431.88	431.53	431.88	430.78	431.28	431.53	431.93	431.38	432.43	432.23
27	432.58	432.83	431.83	431.38	431.73	430.68	431.28	431.23	431.83	431.43	432.28	432.23
28	432.63	433.43	431.83	430.93	431.48	430.73	431.58	431.18	431.83	431.28	432.28	432.28
29	432.58	......	431.68	430.88	431.53	430.58	431.18	431.08	431.63	431.33	432.33	432.43
30	432.63	......	431.63	431.33	431.58	430.63	431.38	431.03	431.58	431.38	432.38	432.58
31	432.63	......	431.58	......	431.48	......	431.18	431.18	......	431.43	......	432.53

LIMESTONE CREEK AT MANLIUS, N. Y.

A gaging station was established July 23, 1907, by Robert E. Horton, for this Department, at Wilcox avenue bridge in Manlius. The gage consists of a triangular box containing a scale graduated to tenths from zero to 7.4, and a chain and weight by which the readings are taken. The gage is attached to the bottom chord on the down-stream side of the bridge. The length of the chain and weight is 14.00 feet. Readings are taken by John Carroll at 7 A. M. and 6 P. M. each day. Current-meter measurements are made from the down-stream side of the bridge, starting at the face of the left-hand abutment as an initial point. The bridge is subdivided into 2.5-foot sections for purposes of measurement. The span is 73 feet.

Current-meter Discharge Measurements of Limestone Creek at Manlius, N. Y.

DATE.	Hydrographer.	GAGE READING.			Meter No.	Lateral interval.	Submergence depth.	Total area.	Total width.	Computed discharge.
		Beginning.	Ending.	Mean.						
1910.						Feet.		Square feet.	Feet.	Second-feet.
June 13	H. V. Button	2.65	2.65	2.65	559	2	0.6	30.2	34	60.3
Aug. 30	A. R. Patchke	2.45	2.45	2.45	559	2	0.6	27.4	31	53.5
Sept. 24	A. T. Clark	1.85	1.85	1.85	559	2	0.6	13.1	31	6.0

Mean Daily Gage Height, in Feet, of Limestone Creek at Wilcox Ave. Bridge, Manlius, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	2.82	3.32	4.80	3.00	2.58	2.62	2.38	2.48	2.42	2.90	2.78	2.78
2.....	2.72	3.50	5.40	3.08	2.70	2.68	2.50	2.30	2.58	2.82	2.52	2.70
3.....	2.50	3.22	5.52	2.95	2.52	2.58	2.42	2.42	2.58	2.85	2.78	3.25
4.....	2.78	3.05	5.58	2.90	2.90	2.70	2.50	2.60	2.58	2.62	3.02	3.15
5.....	2.90	3.10	4.15	2.75	3.02	2.68	2.35	2.48	2.68	2.68	2.92	3.35
6.....	2.72	2.80	4.20	2.65	2.85	2.50	2.38	2.40	2.58	2.82	2.82	2.88
7.....	2.78	3.05	4.05	2.70	2.85	2.62	2.35	2.38	2.92	2.60	2.65	3.22
8.....	2.82	3.02	4.90	2.95	2.72	2.98	2.22	2.28	2.58	2.78	2.95	3.62
9.....	2.68	2.95	3.72	2.70	2.65	2.75	2.20	2.25	2.60	2.65	2.68	3.05
10.....	2.72	3.10	3.88	2.65	2.65	2.88	2.35	2.60	2.78	2.78	3.35	3.22
11.....	2.55	3.05	3.45	2.95	2.62	3.10	2.12	2.58	2.60	2.58	3.30	2.98
12.....	2.75	2.40	3.35	2.90	2.58	2.68	2.32	2.52	2.72	2.75	3.48	3.00
13.....	2.52	2.95	3.52	2.75	2.72	2.80	2.15	2.48	2.68	2.58	3.48	2.25
14.....	2.62	2.90	3.25	2.70	2.52	2.72	2.28	2.62	2.48	2.78	3.55	2.95
15.....	2.60	3.32	3.25	2.80	2.68	2.75	2.45	2.48	2.58	2.72	3.42	3.18
16.....	2.65	3.15	3.20	2.90	2.62	2.65	2.38	2.58	2.50	2.62	3.40	2.38
17.....	2.68	3.00	3.05	2.85	2.58	2.55	2.30	2.55	2.58	2.62	3.55	3.02
18.....	2.65	2.95	3.20	2.75	2.95	2.68	2.32	2.42	2.52	2.60	3.25	3.35
19.....	3.10	2.95	2.95	2.72	2.65	2.78	2.50	2.50	2.55	2.88	3.15	3.05
20.....	3.05	2.88	3.25	2.68	2.78	2.62	2.25	2.50	2.60	2.68	3.05	3.00
21.....	3.05	3.35	3.10	2.62	2.65	2.52	2.35	2.52	2.68	2.78	3.05	3.25
22.....	2.65	3.20	3.20	2.58	2.72	2.32	2.38	2.38	2.48	2.98	2.68	3.00
23.....	2.92	3.22	3.10	2.58	2.68	2.58	2.30	2.58	2.68	3.00	2.42	3.30
24.....	2.82	3.08	2.95	2.72	2.58	2.70	2.52	2.45	2.78	2.48	2.55	3.25
25.....	3.72	3.05	3.05	2.60	3.35	2.65	2.38	2.38	2.78	2.72	2.50	2.85
26.....	3.30	3.15	3.05	2.62	3.10	2.78	2.58	2.48	2.80	2.95	2.52	2.80
27.....	3.62	4.10	3.05	2.65	2.95	2.90	2.70	2.42	2.95	2.58	2.70	3.15
28.....	3.58	3.70	3.12	2.70	2.92	2.58	2.50	2.55	2.90	2.75	2.58	2.95
29.....	3.10	......	3.02	2.72	2.78	2.70	2.58	2.42	3.15	2.68	2.88	2.70
30.....	2.75	......	3.05	2.55	2.48	2.58	2.40	2.48	2.80	2.62	2.82	3.20
31.....	2.80	......	3.10	......	2.52	......	2.50	2.48	......	2.65	......	2.95

ONEIDA CREEK.

DESCRIPTION.

The head waters of Oneida creek are in northeastern Madison county. Above Peterboro the drainage is mostly through a swamp averaging one-half mile in width by 2½ miles in length. The stream flows easterly from this swamp to the foot of the falls above Munnsville. In the vicinity of the falls the stream descends from elevation 1,100 to elevation 700 in about three miles. From Munnsville to Oneida the creek flows through a somewhat dissected valley of one mile average width, bordered by steep slopes rising 500 feet or more within a distance of one mile on either side. North of Oneida Castle the drainage is rather flat. Oneida creek enters the eastern end of Oneida lake near South Bay, the elevation of the lake being at 370. Water-power is utilized at Oneida Community and at Munnsville. A feeder dam at Oneida Castle diverts most of the low-water flow to the Erie canal through a feeder 2.9 miles long entering the canal at Durhamville. The drainage basin as a whole is irregularly pear-shaped and the upper basin is broad. The slopes are steep and the tributaries are well distributed and moderately branching. This basin is shown on the Morrisville, Oneida, Chittenango and Cazenovia sheets of the U. S. Geological Survey topographic map.

ONEIDA CREEK AT KENWOOD, N. Y.

A gaging station was established at the Oneida Community Dam and Silk Mill, June 11, 1907, by Robert E. Horton. A four-foot enamelled steel gage graduated to hundredths of feet is attached to a tree on the left-hand bank of Oneida creek, 175 feet up-stream from the dam. The dam is of timber, having a crest length of 79.25 feet. The crest is nearly level and the cross-section is uniform throughout the entire length. A board gage with painted 10th-foot marks was also placed in the tail-race immediately below the silk mill. The silk mill contains one 24-inch Hercules and one 24-inch Camden water-wheel. Records are kept by H. L. Mason, showing the crest and tail-race gage readings each morning and night, together with the gate opening and number of hours run per day for each water-wheel. The elevations are referred to an assumed bench-mark consisting of a chiselled cross on the up-stream corner of the right-hand abutment of the dam.

Elevation of assumed bench-mark	100.00
Elevation of crest gage zero	94.01
Mean crest elevation, about	95.60
Tail-race gage zero	82.97

Current-meter measurements were made in the tail-race to determine the turbine discharge in 1907.

The results of gagings at this station, 1898 to 1900, inclusive, may be found in the report of State Engineer and Surveyor for 1902, supplement, pages 49–52. Additional data is given in the report for 1906, supplement, pages 138–139.

Mean Daily Discharge, Second-feet, of Oneida Creek at Kenwood, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	21	71	912	93	154	81	12	57	19	66	93	66
2	55	52	548	69	143	60	35	33	15	75	78	66
3	35	75	461	65	119	68	68	14	23	83	70	84
4	30	59	402	54	65	56	81	13	68	34	75	81
5	25	81	377	47	55	98	81	13	68	45	91	73
6	24	60	419	38	59	144	95	10	86	51	81	51
7	30	65	462	46	138	150	75	55	62	51	90	51
8	18	70	401	66	154	134	55	47	31	23	75	19
9	60	52	200	86	109	85	55	10	22	81	75	48
10	36	70	337	78	90	74	55	11	12	59	101	71
11	23	22	287	83	86	176	44	9	55	39	87	81
12	23	63	291	73	78	151	16	34	50	39	115	40
13	26	55	267	56	70	144	10	58	24	39	95	45
14	23	70	200	53	62	65	*b*	68	19	48	104	51
15	19	63	190	70	137	26	*b*	63	28	37	89	29
16	60	65	183	47	89	25	13	20	22	81	89	36
17	89	48	176	46	66	31	68	19	9	52	79	27
18	89	59	144	53	41	29	48	16	55	29	73	68
19	73	65	139	34	46	56	46	15	54	21	92	27
20	83	75	122	36	35	52	26	11	17	20	81	21
21	183	96	144	40	50	44	19	44	16	20	96	25
22	349	90	134	66	115	30	14	49	16	16	84	20
23	211	65	183	131	102	33	8	16	16	81	79	18
24	197	48	176	137	55	20	55	15	11	59	109	21
25	142	65	200	84	158	17	62	8	60	48	104	68
26	95	70	185	58	174	18	17	6	83	51	109	81
27	70	*a*	189	58	176	14	13	14	70	75	95	42
28	90	*a*	182	53	162	19	14	55	90	59	75	34
29	68	......	134	57	147	17	13	50	83	66	79	92
30	68	......	120	58	160	12	35	16	65	75	73	103
31	96	......	70	......	71	......	55	15	......	70	......	69
Mean	78	64	266	64	102	64	38	28	42	51	88	52

a Above gage; no record. *b* Dam broken; no record.

Monthly Discharge of Oneida Creek at Kenwood, N. Y.

[Drainage area, 63 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
January	349	18	78	1.24	1.43
February	96	22	64	1.02	1.06
March	912	70	266	4.22	4.86
April	137	34	64	1.02	1.14
May	176	41	102	1.62	1.87
June	176	12	64	1.02	1.14
July	95	8	38	0.603	0.695
August	68	6	28	0.444	0.512
September	90	9	42	0.667	0.744
October	83	16	51	0.810	0.934
November	115	70	88	1.46	1.56
December	103	18	52	0.825	0.951

SENECA RIVER DRAINAGE BASIN.

DESCRIPTION.

Seneca river receives the drainage from the central group of lakes lying southward from Lake Ontario, known as the finger lakes. The drainage basin is rolling, though not precipitous, excepting for the deep narrow valleys crossing it, in which the lakes are situated, and certain additional valleys not at the present time occupied by lakes. All of the lakes properly belonging to the finger lake system do not drain into the Seneca river. Oneida lake on the east is tributary to Oneida river, while on the west of the Seneca river there is a series of lakes, including Honeoye, Canadice, Hemlock and Conesus lakes, smaller than, but parallel with and otherwise similar to the main finger lakes, which are tributary to Genesee river. The upper lakes of the system in the Seneca river basin are Onondaga, Otisco, Skaneateles, Owasco, Cayuga, Seneca, Keuka and Canandaigua lakes.

The stream designated as Seneca river originates at the outlet of Seneca lake, flows easterly to the foot of Cayuga lake, which discharges into it, and then northerly through the extensive Montezuma marshes to a point near Savannah where it leaves the broad marsh area and turns easterly, passing to the north of Syracuse, and receiving Onondaga outlet, then turning northerly and joining Oneida river at Three River Point to form the Oswego river. The most important tributaries of Seneca river are the outlets of Onondaga, Otisco, Skaneateles and Owasco lakes, and Clyde river, which enters the Seneca river near Clyde, and which in turn is formed by the junction of Mud creek and Canandaigua outlet at Lyons.

WATER-SURFACE ELEVATION RECORDS ON SENECA RIVER AND TRIBUTARIES.

The following tables show the mean daily elevation of water-surface at different gages maintained on Seneca river and tributaries during the year 1910. The elevation of water-surface is referred to Barge canal datum, which is equivalent to mean tide at New York, taking the bench-mark at Greenbush (Rensselaer) as 14.73.

The accompanying table shows the details of the different gages and the manner in which the readings are taken.

Water-surface Elevation Gages Maintained on the Seneca River and Tributaries During the Year 1910.

STREAM.	Location.	Date established.	Observer.	Elevation of zero mark (B. C. datum).	Type of gage.	Sub-division of gage.	Read-ings taken to	Usual Time of Reading.	
								A. M.	P. M.
Seneca river	Head of Gascon Reef, Belgium	April 16, 1904	Solomon Watts	360.31	Staff	$\frac{1}{10}$ Foot	$\frac{1}{10}$ Foot	7	.....
" "	Highway bridge, Belgium	April 14, 1904	" "	358.27	Chain	"	"	7	.....
" "	Mud lock, No. 5, Liverpool	April 16, 1904	Frank Shane	360.37	Staff	"	"	A. M.	.....
" "	Below dam, Baldwinsville	Nov. 12, 1898	Chas. Brannock	361.75	Chain	"	"	8	4
" "	Above " "	Nov. 12, 1898	" "	372.10	Staff	"	"	8	4
" "	Below Jack's Reef, Memphis	April 20, 1904	Frank Burns	374.00	"	"	"	9	.....
" "	Above " " Jordan	April 20, 1904	John P. Watts	375.44	"	"	"	A. M.	.....
" "	Cross Lake bridge, "	May 1, 1904	M. Quimby	373.66	"	"	"	7	2
" "	Mosquito Point bridge, Port Byron	April 21, 1904	Wm. Prettie	375.85	"	"	"	9	.....
" "	Savannah	May 4, 1904	J. H. Rupert	376.00	Chain	"	"	8	.....
" "	Cayuga lake, near Seneca Falls	Oct. 10, 1905	A. Dumont	381.47	Staff	"	"	9	5
" "	Above lock No. 8, " "	Aug. 11, 1909	" "	384.73	"	"	"	9	5
" "	Below lock No. 7, " "	Aug. 7, 1909	Daniel Havens	384.41	"	"	"	8	5
" "	Below lock No. 6, " "	Nov. 16, 1909	" "	391.41	"	"	"	8	5
" "	Above river wall, " "	Aug. 16, 1909	B. C. office employee	427.09	"	"	"	7	5
" "	Below lock No. 2, Waterloo	Aug. 11, 1909	Geo. W. Graves	428.53	"	"	"	7	5
" "	Above lock No. 1, "	Aug. 11, 1909	" " "	443.37	"	"	"	7	5
" "	Below guard-lock, Geneva	April 16, 1904	Wm. Van Kirk	445.83	"	"	"	8	5
" "	Above " " "	May 14, 1904	" " "	445.73	"	"	"	8	5
Onondaga outlet	Long Branch, Liverpool	April 16, 1904	Joseph Kennedy	360.88	"	"	"	8	.....
" lake	Syracuse	May 14, 1904	Chas. Bourke	369.55	Ref. point		"	8	.....
" creek	Temple st. bridge, Syracuse	Jan. 1, 1908	L. W. Moulton	376.11	Chain	$\frac{1}{10}$ Foot	"	....	1
Clyde river	Clyde	Oct. 20, 1905	B. C. office employee	380.00	"	"	"	....	1
" "	Lyons	Sept. 27, 1905	B. C. office employee	390.00	"	"	"	....	1
Ganargua creek	Newark	Nov. 29, 1905	Wm. J. Schwartz	406.00	"	"	"	....	1
" "	Palmyra	Mar. 25, 1907	C. Henry Harrison	419.03	Staff	"	"	....	1
Canandaigua outlet	Alloway bridge, near Lyons	Sept. 18, 1906	Carl Tuscher	403.32	"	"	"	9	4
" lake	Canandaigua	Sept. 10, 1909	A. H. O'Reilly	*a*	"	"	"	8	.....
Flint creek	Phelps	Aug. 5, 1910	Edward Fitzgerald	*a*	Chain	"	"	7	6
Cayuga lake	Ithaca	Aug. 6, 1905	John Hathorn	381.75	Staff	"	"	10	.....

a Referred to arbitrary datum.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River at Head of Gascon Reef, near Belgium, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	361.11	362.61	364.01	364.31	363.31	362.91	361.31	360.91	361.21	360.71	361.51	362.91
2.....	361.01	362.41	364.51	364.01	363.41	362.71	361.31	360.61	360.91	360.51	361.51	362.91
3.....	361.01	362.41	364.81	364.01	363.41	362.61	361.41	360.81	360.91	361.21	361.41	362.61
4.....	360.91	362.41	365.31	363.91	363.31	362.51	361.21	360.91	361.31	360.91	361.31	362.71
5.....	360.71	362.41	365.61	363.81	363.41	362.71	361.11	360.81	361.31	360.81	361.71	362.81
6.....	360.51	362.41	365.81	363.71	363.21	363.01	360.91	360.31	361.41	361.21	362.01	362.61
7.....	360.31	362.31	366.01	363.61	363.11	362.81	360.81	360.71	361.41	361.01	361.91	362.51
8.....	360.31	362.31	365.91	363.51	363.21	362.81	360.91	360.91	361.41	361.11	361.81	362.41
9.....	360.31	362.31	366.61	363.31	363.21	362.81	361.01	360.71	361.51	361.31	361.81	362.31
10.....	360.31	362.31	366.71	363.31	363.11	362.71	361.31	360.81	361.51	361.41	361.91	362.21
11.....	360.01	362.21	366.81	363.31	362.91	362.71	361.31	360.81	361.61	361.41	362.01	362.11
12.....	359.91	362.31	366.71	363.21	362.71	362.81	361.21	361.01	361.71	361.21	362.01	362.21
13.....	359.91	362.31	366.61	363.11	362.51	362.71	361.11	361.11	361.81	361.11	362.21	362.11
14.....	359.81	362.31	366.51	363.11	362.71	362.51	361.11	360.81	361.61	361.01	362.41	362.11
15.....	359.81	362.41	366.31	363.11	362.71	362.41	361.01	361.11	361.31	360.91	362.41	362.11
16.....	359.81	362.31	366.21	363.01	362.61	362.31	360.91	361.11	361.11	361.11	362.51	362.01
17.....	359.91	362.31	366.01	363.11	362.61	362.31	361.21	361.11	361.11	361.41	362.41	361.91
18.....	359.91	362.21	365.71	363.11	362.51	362.11	361.01	361.01	361.21	361.51	362.41	362.01
19.....	360.11	362.21	365.51	363.01	362.51	362.11	360.91	361.01	361.31	361.31	362.51	362.11
20.....	360.61	362.31	365.31	363.01	362.51	362.11	360.71	360.81	361.41	361.31	362.51	362.11
21.....	361.01	362.31	365.31	363.01	362.61	361.81	360.81	360.81	361.01	361.21	362.51	362.01
22.....	361.51	362.31	365.11	362.91	362.81	361.71	360.71	361.31	360.61	361.31	362.61	361.91
23.....	361.91	362.21	365.01	362.91	362.61	361.61	360.61	361.21	360.71	361.41	362.71	361.71
24.....	362.01	362.21	364.91	362.81	362.71	361.61	360.81	361.01	360.71	361.51	362.71	361.71
25.....	362.31	362.41	364.81	362.91	362.71	361.61	360.71	361.01	360.71	361.31	362.81	361.81
26.....	362.61	362.31	364.71	363.11	362.81	361.61	360.81	360.81	360.91	361.21	362.91	361.71
27.....	362.91	362.31	364.61	362.91	362.81	361.51	360.71	360.81	360.81	361.41	362.91	361.91
28.....	362.81	363.01	364.71	363.11	362.91	361.41	360.71	360.71	361.11	361.41	362.81	362.11
29.....	362.71	......	364.51	363.11	363.01	361.41	360.81	360.81	361.01	361.31	362.81	362.11
30.....	362.61	......	364.51	363.21	363.11	361.41	360.91	360.91	360.81	361.41	362.81	362.31
31.....	362.51	......	364.41	......	363.11	......	361.01	361.21	......	361.51	......	362.21

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River at Highway Bridge, Belgium, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	361.24	362.74	363.94	364.74	363.64	363.17	361.47	360.87	361.07	360.97	361.77	363.17
2.....	361.04	362.54	364.74	364.54	363.74	362.97	361.47	360.77	361.07	360.57	361.77	363.17
3.....	361.04	362.54	365.24	364.54	363.74	362.87	361.37	361.07	361.07	361.27	361.67	362.77
4.....	360.94	362.54	365.54	364.44	363.64	362.67	361.47	361.17	361.37	361.07	361.77	362.87
5.....	360.84	362.54	365.94	364.34	363.74	362.87	361.37	360.97	361.47	360.77	361.97	363.07
6.....	360.44	362.54	366.24	364.24	363.74	363.17	361.27	360.67	361.47	361.17	362.07	362.87
7.....	360.34	362.44	366.54	364.14	363.64	363.07	361.07	360.77	361.47	360.97	362.17	362.77
8.....	360.34	362.44	367.04	363.94	363.74	363.07	361.17	361.07	361.47	361.17	362.07	362.57
9.....	360.24	362.44	367.14	363.84	363.74	363.07	361.27	360.97	361.57	361.47	362.07	362.47
10.....	360.34	362.54	367.34	363.64	363.64	362.97	360.57	360.87	361.57	361.77	362.27	362.27
11.....	360.34	362.54	367.44	363.64	363.44	362.97	360.57	360.87	361.67	361.77	362.37	362.17
12.....	360.14	362.64	367.34	363.54	363.24	363.07	361.37	361.07	361.77	361.67	362.37	362.27
13.....	359.94	362.54	367.24	363.44	363.04	362.97	361.27	361.17	361.87	361.57	362.47	362.17
14.....	359.94	362.64	367.04	363.44	362.94	362.77	361.17	360.87	361.67	361.47	362.67	362.17
15.....	359.84	362.54	366.84	363.44	362.94	362.67	361.17	361.17	361.47	361.37	362.67	362.17
16.....	360.04	362.44	366.74	363.34	362.84	362.57	361.07	361.27	361.27	361.37	362.77	362.07
17.....	360.24	362.44	366.54	363.24	362.84	362.57	361.27	361.27	361.27	361.57	362.67	361.97
18.....	360.34	362.34	366.24	363.34	362.74	362.47	361.57	361.17	361.37	361.67	362.67	362.07
19.....	360.54	362.34	366.04	363.24	362.74	362.47	361.07	361.27	361.47	361.47	362.77	362.27
20.....	360.64	362.44	365.84	362.94	362.47	362.47	360.87	360.97	361.57	361.47	362.77	362.27
21.....	360.94	362.44	365.84	362.94	362.57	362.17	360.97	360.97	361.07	361.37	362.77	362.17
22.....	360.94	362.44	365.64	362.94	362.77	362.07	361.07	361.37	360.87	361.47	362.87	361.97
23.....	361.34	362.34	365.44	363.04	362.77	361.97	360.97	361.17	360.77	361.57	362.87	361.97
24.....	362.14	362.34	365.34	362.74	362.87	361.97	361.17	360.97	360.77	361.67	362.97	361.87
25.....	362.34	362.54	365.24	362.84	362.87	361.97	361.37	360.97	360.77	361.47	362.97	361.97
26.....	362.44	362.44	364.84	363.04	362.97	361.87	360.97	360.77	361.27	361.37	363.07	361.87
27.....	362.74	362.44	365.04	362.94	362.97	361.77	360.87	360.77	360.97	361.57	363.17	362.07
28.....	362.64	362.94	365.14	363.44	363.07	361.67	360.87	361.17	361.27	361.57	363.07	362.17
29.....	362.54	......	364.94	363.94	363.07	361.57	360.97	361.17	361.17	361.47	363.07	362.17
30.....	362.64	......	364.94	364.04	363.27	361.57	361.07	360.97	360.97	361.57	363.07	362.47
31.....	362.74	......	364.84	......	363.27	......	361.17	361.27	......	361.77	......	362.37

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River at Mud Lock, near Long Branch, Liverpool P. O., N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	360.75	362.65	363.95	364.75	363.91	363.07	361.23	360.79	361.19	361.26	362.07	362.97
2.....	360.75	362.65	365.15	364.65	363.91	363.07	361.23	360.79	361.29	361.36	362.07	362.97
3.....	360.95	362.55	365.35	364.65	364.01	363.07	361.13	360.79	361.29	361.17	361.97	362.97
4.....	360.95	362.75	365.85	364.65	364.01	363.07	361.13	360.89	361.29	361.07	361.97	362.97
5.....	361.25	362.75	366.25	364.45	363.91	363.07	361.13	360.89	361.29	360.97	361.97	362.97
6.....	361.45	362.75	366.85	364.35	363.91	363.17	361.13	360.79	361.29	360.97	361.97	362.87
7.....	361.75	362.65	367.25	364.35	363.91	363.27	361.03	360.79	361.39	361.07	362.07	362.87
8.....	361.85	362.65	367.45	364.25	363.91	363.17	361.03	360.79	361.39	361.07	362.07	362.77
8.....	362.05	362.55	367.65	364.25	363.81	363.17	361.13	360.89	361.59	361.17	362.07	362.77
10.....	362.45	362.55	367.75	364.15	363.81	363.27	361.23	360.89	361.79	361.27	362.17	362.77
11.....	362.45	362.35	367.75	364.05	363.41	363.27	361.43	361.09	361.76	361.27	362.37	362.67
12.....	360.45	362.35	367.65	363.85	363.41	363.07	361.43	360.99	361.76	361.37	362.47	362.67
13.....	359.75	362.35	367.55	363.65	363.31	362.97	361.43	360.99	361.66	361.37	362.47	362.77
14.....	359.55	362.35	367.35	363.55	363.31	362.97	361.43	360.99	361.56	361.47	362.67	362.87
15.....	360.23	362.35	367.25	363.45	363.21	362.77	361.33	361.09	361.46	361.47	362.67	362.87
16.....	360.23	362.45	366.95	363.35	363.21	362.67	361.23	361.09	361.46	361.47	362.77	362.97
17.....	360.21	362.75	366.85	363.35	363.21	362.67	361.13	361.19	361.56	361.47	362.77	362.87
18.....	360.23	362.75	366.65	363.35	363.11	362.67	361.03	361.29	361.46	361.67	362.97	362.87
19.....	360.25	362.65	366.35	363.45	363.11	362.67	360.93	361.29	361.36	361.37	362.97	362.77
20.....	359.55	362.55	366.25	363.35	363.11	362.57	360.93	361.19	361.26	361.27	362.97	362.77
21.....	359.75	362.35	366.05	363.35	363.11	362.47	361.03	361.19	361.16	361.77	362.97	362.77
22.....	361.35	362.35	365.85	363.25	363.11	362.27	361.23	361.09	361.16	361.87	362.97	362.67
23.....	361.95	362.35	365.65	363.25	363.21	362.07	361.23	361.09	361.26	361.87	363.07	362.67
24.....	362.35	362.35	365.45	363.25	363.21	361.97	361.23	360.99	361.26	361.87	363.07	362.67
25.....	362.35	362.55	365.45	363.35	363.21	361.67	361.13	360.99	361.36	361.87	363.07	362.87
26.....	362.55	362.55	365.35	363.35	363.21	361.57	361.03	361.09	361.46	361.87	363.07	362.87
27.....	362.75	362.85	365.25	363.45	363.31	361.57	360.93	361.19	361.66	361.97	363.07	362.77
28.....	362.75	363.35	365.25	363.65	363.31	361.47	360.73	361.19	361.46	361.97	362.97	362.77
29.....	362.75	......	365.15	363.85	363.11	361.37	360.73	361.09	361.46	362.07	362.97	362.77
30.....	362.85	......	365.05	363.85	363.11	361.27	360.93	361.09	361.36	362.07	362.97	362.87
31.....	362.85	......	364.85	......	363.11	......	360.93	361.09	......	362.17	......	362.87

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Onondaga Outlet, near Long Branch, Liverpool P. O., N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	361.38	362.88	364.88	364.98	363.78	363.38	361.98	361.38	361.48	361.38	361.88	363.38
2.....	361.38	362.88	365.48	364.88	363.88	363.28	361.98	361.38	361.48	361.38	361.88	363.38
3.....	361.38	362.88	365.78	364.78	363.88	363.18	361.98	361.38	361.48	361.38	361.98	363.28
4.....	361.38	362.88	366.08	364.68	363.88	363.08	361.88	361.38	361.48	361.48	361.98	363.28
5.....	361.38	362.88	366.18	364.58	363.88	363.18	361.88	361.38	361.58	361.48	362.08	363.28
6.....	361.28	362.88	366.58	364.48	363.88	363.28	361.78	361.38	361.58	361.48	362.18	363.18
7.....	361.28	362.78	366.88	364.38	363.88	363.48	361.78	361.38	361.68	361.58	362.28	363.08
8.....	361.28	362.78	367.28	364.28	363.88	363.48	361.68	361.38	361.78	361.58	362.38	362.98
9.....	361.28	362.78	367.68	364.08	363.88	363.48	361.68	361.38	361.88	361.58	362.48	362.88
10.....	361.28	362.78	367.78	363.98	363.78	363.48	361.68	361.38	361.98	361.58	362.48	362.88
11.....	361.18	362.78	367.78	363.78	363.68	363.38	361.68	361.48	361.98	361.68	362.58	362.88
12.....	361.18	362.78	367.78	363.78	363.58	363.38	361.68	361.48	361.88	361.68	362.58	362.78
13.....	361.18	362.68	367.68	363.68	363.48	363.28	361.68	361.48	361.88	361.68	362.68	362.68
14.....	361.18	362.68	367.58	363.68	363.38	363.18	361.58	361.48	361.88	361.68	362.68	362.58
15.....	361.18	362.68	367.38	363.58	363.28	363.08	361.58	361.48	361.78	361.78	362.78	362.48
16.....	361.08	362.58	367.18	363.58	363.28	362.98	361.58	361.58	361.78	361.78	362.78	362.38
17.....	361.08	362.58	366.98	363.58	363.28	362.88	361.58	361.58	361.78	361.78	362.88	362.38
18.....	361.08	362.58	366.78	363.48	363.18	362.78	361.58	361.58	361.68	361.78	362.88	362.28
19.....	360.98	362.58	366.58	363.38	363.18	362.78	361.58	361.58	361.68	361.88	362.98	362.18
20.....	360.98	362.58	366.38	363.28	363.08	362.68	361.58	361.68	361.68	361.88	362.98	362.08
21.....	360.98	362.58	366.18	363.18	363.08	362.58	361.58	361.68	361.58	361.88	363.08	362.08
22.....	360.98	362.58	365.98	363.18	363.08	362.48	361.58	361.68	361.58	361.88	363.08	362.18
23.....	361.28	362.58	365.78	363.08	363.18	362.38	361.58	361.58	361.58	361.88	363.18	362.38
24.....	361.68	362.68	365.68	363.08	363.28	362.28	361.48	361.58	361.58	361.88	363.18	362.58
25.....	362.08	362.68	365.58	363.18	363.38	362.18	361.48	361.58	361.48	361.88	363.28	362.68
26.....	362.38	362.68	365.48	363.28	363.38	362.18	361.48	361.48	361.48	361.88	363.38	362.58
27.....	362.58	362.78	365.38	363.38	363.48	362.08	361.48	361.48	361.48	361.88	363.38	362.58
28.....	362.78	363.48	365.28	363.48	363.48	362.08	361.48	361.48	361.48	361.88	363.38	362.68
29.....	362.88	......	365.18	363.58	363.48	361.98	361.38	361.48	361.38	361.88	363.38	362.88
30.....	362.88	......	365.08	363.68	363.48	361.98	361.38	361.48	361.38	361.88	363.38	363.08
31.....	362.88	......	365.08	......	363.48	......	361.38	361.48	......	361.88	......	363.28

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Onondaga Creek at Temple St., Syracuse, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	*a*	378.46	385.84	379.44	378.71	379.08	378.43	378.51	378.46	*a*	378.48	379.38
2.....	*a*	378.63	385.08	*a*	378.81	379.12	378.47	378.33	378.39	378.86	378.51	379.31
3.....	378.43	378.94	383.22	*a*	379.11	379.20	378.51	378.26	378.48	378.71	378.57	379.14
4.....	378.17	378.64	382.44	379.20	379.29	379.08	378.49	378.26	378.33	378.41	378.55	379.21
5.....	378.48	*a*	381.84	379.20	379.08	379.07	378.41	378.31	378.36	378.68	379.03	379.10
6.....	378.43	378.51	381.66	379.14	379.01	379.63	378.31	378.26	378.69	379.11	379.50	378.68
7.....	378.41	378.95	383.26	379.25	378.97	379.84	378.51	*a*	379.77	378.99	379.21	378.75
8.....	378.39	378.77	382.36	379.28	378.68	379.56	378.42	378.31	379.09	378.43	379.24	378.90
9.....	378.42	378.85	380.73	*a*	378.72	379.16	379.09	378.31	*a*	378.46	379.01	378.90
10.....	378.43	378.88	380.79	379.06	379.14	379.06	378.31	378.51	378.61	378.86	379.36	378.68
11.....	378.29	378.70	380.41	378.95	379.16	379.24	378.30	378.61	*a*	378.85	379.63	378.81
12.....	378.38	378.67	380.41	379.31	378.92	379.04	378.33	378.49	378.59	378.32	379.12	379.00
13.....	378.43	*a*	380.37	379.21	378.84	379.04	378.62	378.56	378.41	378.82	379.13	378.95
14.....	378.49	378.61	380.28	379.04	378.84	378.96	378.45	*a*	378.83	378.76	379.31	379.10
15.....	378.59	378.76	380.08	379.01	378.67	378.94	378.34	378.42	378.69	378.68	*a*	378.94
16.....	*a*	378.76	380.00	378.77	378.61	378.89	378.31	378.14	378.49	378.44	379.21	378.83
17.....	378.16	379.08	379.87	*a*	378.60	378.78	378.32	378.28	378.67	378.76	379.48	378.75
18.....	378.60	378.99	379.63	378.60	378.76	378.88	378.30	378.35	378.47	378.68	379.09	378.85
19.....	379.04	379.11	379.65	378.71	378.62	378.70	378.34	378.64	378.52	378.38	379.14	378.94
20.....	*a*	379.09	*a*	379.00	378.49	378.66	378.32	378.29	378.84	*a*	379.01	379.02
21.....	379.16	378.90	380.72	378.92	*a*	378.50	378.35	378.27	378.89	378.60	378.03	378.97
22.....	380.69	*a*	379.89	378.91	379.03	378.53	378.61	378.50	378.52	378.68	379.08	379.08
23.....	*a*	379.16	380.12	378.71	379.52	378.50	378.39	*a*	378.66	378.83	379.08	378.96
24.....	380.17	378.97	*a*	378.84	*a*	378.51	378.32	378.61	379.11	378.71	379.06	378.82
25.....	379.71	379.09	380.04	379.01	*a*	378.46	378.13	378.60	379.01	378.73	378.98	378.92
26.....	379.31	379.04	379.91	*a*	380.15	378.43	378.39	378.41	379.21	378.51	378.83	378.74
27.....	379.09	*a*	379.64	378.83	379.21	378.47	378.37	378.44	378.96	378.91	378.90	378.80
28.....	379.18	383.35	379.64	378.67	379.08	378.40	378.35	378.44	379.21	378.88	378.99	378.94
29.....	*a*	......	379.64	379.08	379.02	378.42	378.30	378.28	378.95	378.86	379.07	379.06
30.....	378.74	......	379.71	*a*	378.94	378.31	378.20	378.36	*a*	378.46	379.39	379.34
31.....	379.01	......	379.48	......	379.08	......	378.39	378.38	......	378.48	......	379.58

a No record.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River below Dam at Baldwinsville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	362.95	363.75	364.85	366.02	365.75	365.05	363.97	363.35	363.23	363.37	363.80	364.25
2......	362.85	363.60	365.80	365.90	365.75	365.05	363.95	363.33	363.23	363.27	363.90	364.25
3......	363.00	363.53	366.45	365.75	365.75	365.05	363.95	363.33	363.20	363.40	363.95	364.25
4......	363.03	363.42	366.93	365.70	365.75	364.95	363.90	363.20	362.95	363.43	363.90	364.25
5......	363.07	333.35	367.05	365.60	355.75	364.75	363.75	363.20	363.13	363.43	363.90	364.25
6......	363.05	363.37	367.35	365.40	365.75	364.95	363.70	363.20	363.23	363.50	363.80	364.10
7......	363.05	363.55	367.95	365.35	365.75	365.05	363.65	362.95	363.35	363.55	363.80	363.95
8......	363.05	363.50	368.47	365.20	365.75	365.00	363.65	363.10	363.55	363.55	363.85	363.95
9......	363.05	363.50	368.70	365.15	365.75	364.95	363.63	363.20	363.67	363.55	363.80	363.85
10......	363.05	363.45	368.90	365.05	365.75	364.95	363.57	363.20	363.65	363.55	363.85	363.75
11......	363.05	363.45	368.95	364.95	365.05	364.95	363.57	363.20	363.55	363.55	363.95	363.55
12......	363.05	363.75	368.95	364.95	364.75	364.95	363.55	363.20	363.55	363.60	393.95	363.55
13......	363.05	363.45	368.75	364.85	364.75	364.95	363.55	363.20	363.55	363.55	393.90	363.55
14......	363.05	363.15	368.55	364.80	364.75	364.90	363.55	363.00	363.65	363.55	363.95	363.45
15......	363.05	363.55	368.25	364.75	364.75	364.65	363.55	363.15	363.65	363.55	363.95	363.55
16......	363.05	363.45	368.25	364.75	364.75	364.65	363.55	363.20	363.55	363.50	363.95	363.60
17......	363.05	363.45	367.90	364.75	364.75	364.65	363.55	363.20	363.50	363.60	363.95	363.55
18......	363.05	363.55	367.80	364.75	364.75	364.53	363.50	363.20	363.25	363.55	363.95	363.25
19......	362.95	363.50	367.50	364.75	364.75	364.50	363.40	363.25	363.35	363.55	363.95	363.25
20......	362.97	363.45	366.90	364.65	364.85	364.47	363.43	363.25	363.35	363.55	363.90	363.25
21......	363.05	363.45	367.15	364.57	364.85	364.43	363.37	363.00	363.35	363.55	364.10	363.35
22......	362.97	363.45	367.05	364.55	364.85	364.35	363.37	363.15	363.25	363.55	364.15	363.50
23......	362.85	363.45	366.90	364.55	364.85	364.27	363.37	363.25	363.25	363.55	364.15	363.55
24......	363.08	363.50	366.75	364.45	364.90	364.25	363.27	363.25	363.25	363.63	364.25	363.65
25......	363.35	363.48	366.65	364.60	365.05	364.15	363.35	363.20	363.20	363.65	364.25	363.70
26......	363.70	363.45	366.65	364.70	365.05	364.15	363.33	363.20	363.35	363.65	364.25	363.80
27......	363.80	363.30	366.40	365.10	365.05	364.07	363.33	363.20	363.37	363.63	364.05	363.80
28......	363.85	363.80	366.40	365.45	365.05	364.03	363.35	362.97	363.37	363.70	364.15	363.85
29......	363.75	......	366.30	365.55	365.05	364.05	363.35	362.97	363.37	363.75	364.15	363.85
30......	363.75	......	366.15	365.75	365.05	364.05	365.35	363.25	363.37	363.75	364.15	363.95
31......	363.75	......	366.15	......	365.05	......	363.30	363.25	......	363.80	......	364.10

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River above Dam at Baldwinsville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	370.75	374.08	374.58	373.48	374.25	375.05	374.32	373.80	373.00	373.95	374.42	374.65
2......	371.00	374.05	375.12	373.30	374.18	375.15	374.25	373.70	372.95	374.08	374.42	374.65
3......	370.35	374.05	375.52	373.32	374.20	375.10	374.48	373.42	373.20	374.02	374.45	374.70
4......	370.00	374.08	375.88	372.90	374.22	375.10	374.45	373.50	373.45	374.05	374.40	374.80
5......	369.80	374.10	376.22	372.75	374.38	375.10	374.32	373.52	373.58	374.05	374.35	374.75
6......	369.65	374.40	376.45	372.38	374.38	375.22	374.30	373.42	373.88	374.12	374.48	374.65
7......	369.55	374.00	367.75	372.55	374.38	375.25	374.28	373.42	374.05	374.12	374.42	374.52
8......	369.70	373.70	376.80	372.40	374.48	375.20	374.25	373.30	374.15	374.20	374.35	374.38
9......	369.75	373.82	376.70	372.60	374.38	375.20	374.28	373.22	374.35	374.30	374.35	374.32
10......	369.55	373.95	376.25	373.55	374.30	375.20	374.38	373.20	374.35	374.28	374.35	374.30
11......	369.45	373.95	376.10	373.30	374.60	375.20	374.30	373.38	374.40	374.20	374.45	374.20
12......	369.50	373.95	376.05	373.20	375.25	375.18	374.20	373.42	374.30	374.15	374.45	374.10
13......	369.50	374.20	376.02	373.15	375.18	375.10	374.20	373.48	374.30	374.15	374.58	374.05
14......	369.45	373.85	375.95	372.65	375.20	375.02	374.20	373.65	374.20	374.15	374.55	373.95
15......	369.45	373.40	375.68	372.50	375.28	374.90	374.20	373.65	374.15	374.12	374.45	374.10
16......	369.85	373.40	375.60	372.42	375.30	374.92	374.20	373.45	374.00	374.25	374.52	374.05
17......	369.65	373.45	375.32	372.78	375.28	374.90	374.32	373.40	373.98	374.15	374.48	374.02
18......	369.55	373.40	375.18	372.62	375.25	374.85	374.18	373.30	374.05	374.10	374.48	373.78
19......	369.80	373.40	375.05	372.52	375.25	374.88	374.00	373.38	373.98	374.08	374.48	373.65
20......	370.20	373.75	375.45	372.55	375.18	374.85	374.08	373.35	373.90	374.00	374.62	373.80
21......	370.42	373.35	374.78	372.70	375.15	374.75	374.05	373.40	373.90	374.15	374.65	373.90
22......	371.15	373.45	374.65	372.80	375.10	374.68	374.00	373.35	373.80	274.15	374.65	373.98
23......	372.60	373.62	374.55	372.75	375.10	374.62	374.05	373.35	373.70	374.38	374.65	374.12
24......	373.28	373.32	374.50	373.18	375.10	374.62	374.18	373.35	373.80	374.30	374.75	374.20
25......	374.10	373.25	374.48	372.90	375.22	374.60	374.05	373.40	373.95	374.35	374.68	374.25
26......	374.38	373.35	374.45	373.55	375.30	374.65	374.00	373.55	373.90	374.35	374.65	374.35
27......	374.52	373.80	374.42	374.18	375.30	374.55	373.90	373.45	373.90	374.35	374.70	374.25
28......	374.58	374.10	374.28	374.15	375.28	374.52	374.08	373.50	373.95	374.38	374.60	374.25
29......	374.50	......	374.05	374.20	375.28	374.42	373.92	373.50	373.95	374.38	374.60	374.30
30......	374.40	......	373.95	374.30	375.18	374.48	373.90	373.25	373.95	374.45	374.58	374.42
31......	374.20	......	373.72	......	375.08	......	373.90	373.00	......	374.42	......	374.48

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River at foot of Jacks Reef, Memphis, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	371.60	374.40	375.00	375.20	375.50	375.80	374.80	374.10	373.40	374.30	374.70	375.10
2......	371.70	374.40	375.90	375.00	375.50	375.80	374.80	374.00	373.50	374.30	374.70	375.10
3......	371.60	374.40	376.40	374.90	375.60	375.80	374.80	373.80	373.50	374.30	374.60	375.10
4......	371.50	374.40	376.80	374.70	375.60	375.80	374.80	373.80	373.80	374.30	374.60	375.10
5......	371.40	374.40	377.60	374.60	375.60	375.80	374.70	373.80	373.80	374.30	374.60	375.00
6......	371.30	374.50	377.90	374.40	375.60	375.90	374.60	373.80	374.00	374.30	374.60	374.90
7......	371.30	374.40	378.40	374.30	375.60	375.90	374.50	373.70	374.20	374.40	374.70	374.90
8......	371.20	374.30	378.70	374.20	375.70	375.90	374.70	373.80	374.40	374.40	374.70	374.80
9......	371.20	374.10	378.80	374.20	375.70	375.90	374.60	373.70	374.70	374.50	374.70	374.70
10......	371.30	374.10	378.60	374.40	375.70	375.90	374.70	373.70	374.70	374.60	374.70	374.60
11......	371.20	374.20	378.40	374.40	375.40	375.80	374.70	373.70	374.70	374.50	374.70	374.60
12......	371.20	374.30	378.20	374.40	375.80	375.80	374.60	373.80	374.70	374.40	374.70	374.50
13......	371.20	374.30	378.00	374.30	375.90	375.70	374.60	373.80	374.60	374.40	374.80	374.40
14......	371.20	374.20	377.90	374.10	375.90	375.60	374.60	373.90	374.60	374.40	374.80	374.40
15......	371.20	374.00	377.70	374.00	375.90	375.50	374.60	374.00	374.50	374.40	374.80	374.30
16......	371.20	374.00	377.50	374.00	375.90	375.40	374.50	373.90	374.40	374.40	374.80	374.20
17......	371.20	374.00	377.30	374.10	375.90	375.30	374.50	373.80	374.40	374.40	374.80	374.10
18......	371.20	373.90	377.10	374.00	375.90	375.30	374.50	373.80	374.30	374.40	374.80	374.10
19......	371.20	373.90	376.90	374.10	375.80	375.20	374.40	373.80	374.30	374.40	374.80	374.00
20......	371.30	374.00	376.90	374.10	375.70	375.20	374.40	373.70	374.30	374.40	374.80	374.00
21......	371.30	373.90	376.70	374.20	375.70	375.20	374.30	373.70	374.20	374.40	374.90	374.00
22......	371.60	373.90	376.50	374.00	375.70	375.10	374.40	373.70	374.10	374.40	374.90	374.10
23......	372.50	373.90	376.30	374.00	375.70	375.00	374.30	373.70	374.10	374.40	375.00	374.20
24......	373.30	373.80	376.20	374.10	375.70	375.00	374.30	373.70	374.00	374.50	375.10	374.30
25......	374.10	373.80	376.10	374.20	375.80	375.00	374.40	373.70	374.10	374.50	375.10	374.50
26......	374.50	373.80	376.10	374.60	375.90	375.00	374.30	373.90	374.10	374.60	375.00	374.60
27......	374.70	374.00	376.00	375.20	375.90	375.00	374.30	373.80	374.10	374.60	375.00	374.60
28......	375.10	374.50	375.90	375.40	375.90	374.90	374.30	373.80	374.20	374.70	374.90	374.60
29......	375.10	......	375.80	375.50	375.90	374.90	374.20	373.80	374.30	374.70	375.00	374.70
30......	374.70	......	375.60	375.50	375.90	374.90	374.20	373.70	374.30	374.70	375.60	374.80
31......	374.50	......	375.40	......	375.90	......	374.10	373.50	......	374.70	......	374.90

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River above Jacks Reef, Jordan, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	371.84	375.14	375.74	376.14	376.34	376.14	374.84	374.04	373.64	374.34	374.74	375.04
2.....	371.84	375.04	376.94	375.94	376.34	376.04	374.74	373.94	373.54	374.34	374.74	375.14
3.....	371.74	375.04	377.44	375.84	376.44	376.04	374.74	373.84	373.54	374.34	374.74	375.14
4.....	371.74	374.94	377.94	375.74	375.44	375.94	374.74	373.74	373.74	374.34	374.74	375.14
5.....	371.74	374.94	378.54	375.64	376.44	375.94	374.74	373.64	373.94	374.34	374.74	375.14
6.....	371.84	374.84	379.04	375.64	376.34	376.04	374.74	373.54	374.14	374.34	374.74	375.14
7.....	371.84	374.64	379.44	375.54	376.34	376.04	374.74	373.54	374.34	374.44	374.74	375.04
8.....	371.84	374.54	379.74	375.34	376.34	375.94	374.74	373.64	374.44	374.44	374.74	375.04
9.....	371.84	374.34	379.94	375.24	376.34	375.94	374.74	373.64	374.54	374.54	374.74	374.94
10.....	371.84	374.34	380.04	375.14	376.34	375.94	374.74	373.74	374.64	374.54	374.74	374.94
11.....	371.84	374.34	379.84	375.04	376.34	375.94	374.74	373.74	374.74	374.64	374.84	374.84
12.....	371.84	374.34	379.54	375.04	376.34	375.84	374.64	373.84	374.74	374.64	374.84	374.84
13.....	371.84	374.34	379.44	374.94	376.34	375.84	374.64	373.84	374.64	374.54	374.84	374.74
14.....	371.84	374.34	379.24	374.94	376.34	375.74	374.64	373.84	374.84	374.54	374.84	374.64
15.....	371.84	374.24	378.94	374.84	376.34	375.64	374.64	373.84	374.54	374.54	374.84	374.54
16.....	371.84	374.24	378.74	374.84	376.24	375.54	374.64	373.74	374.54	374.54	374.84	374.44
17.....	371.84	374 14	378.44	374.74	376.24	375.54	374.54	373.74	374.44	374.54	374.84	374.34
18.....	371.84	374.04	378.44	374.64	376.14	375.44	374.54	373.74	374.34	374.54	374.84	374.24
19.....	371.84	373.94	378.34	374.64	376.14	375.34	374.44	373.74	374.34	374.44	374.84	374.14
20.....	371.84	374.04	378.24	374.54	376.04	375.34	374.44	373.74	374.24	374.44	374.84	374.14
21.....	371.94	374.24	378.04	374.54	376.04	375.24	374.34	373.64	374.24	374.44	374.94	374.24
22.....	371.94	374.24	377.74	374.64	376.04	375.24	374.34	373.64	374.14	374.44	374.94	374.34
23.....	372.64	374.14	377.44	374.64	376.04	375.14	374.34	373.64	374.04	374.44	374.94	374.44
24.....	373.44	374.14	377.24	374.74	376.14	375.14	374.34	373.74	374.04	374.54	374.94	374.54
25.....	373.94	374.04	377.14	375 04	376.14	375.04	374.34	373.84	374.14	374.54	374.94	374.64
26.....	374.64	374 04	377.04	375.34	376.24	375.04	374.24	373.84	374.14	374.64	375.04	374.74
27.....	375.04	374.14	376.94	375.74	376.24	374.94	374 24	373.74	374.24	374.64	375.04	374.74
28.....	375.04	375.04	376.84	375.94	376.24	374.94	374.24	373.74	374.24	374.64	375.04	374.84
29.....	375.14	......	376.64	376.14	376.24	374.84	374.24	373.74	374.24	374.74	375.04	374.84
30.....	375.14	......	376.44	376.24	376.14	374.84	374.14	373.64	374.34	374.74	375.04	374.94
31.....	375.14	......	376.34	......	376.14	......	374.14	373.64	......	374.74	......	374.94

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River at Cross Lake, Jordan, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	371.86	374.86	375.71	376.26	376.36	376.16	374.86	374.16	373.46	374.36	374.86	375.26
2.....	371.76	374.76	376.66	376.11	376.36	376.06	374.86	374.06	373.56	374.36	374.96	375.26
3.....	371.66	374.76	377.51	375.91	376.36	376.06	374.86	373.96	373.56	374.36	374.96	375.26
4.....	371.56	374.76	378.06	375.71	376.36	375.96	374.86	373.86	373.81	374.36	374.96	375.26
5.....	371.56	374.76	378.56	375.56	376.36	375.96	374.76	373.86	373.96	374.46	374.96	375.26
6.....	371.46	374.76	379.11	375.46	376.46	376.06	374.76	373.86	374.21	374.46	374.86	375.16
7.....	371.46	374.76	379.61	375.36	376.46	376.16	374.76	373 86	374.46	374.56	374.86	375.06
8.....	371.46	374.56	380.01	375.26	376.46	376.16	374.76	373.86	374.56	374.56	374.76	374.96
9.....	371.46	374.46	380.16	375 16	376.46	376.16	374.66	373.76	374.71	374.66	374.76	374.86
10.....	371.46	374 36	380.11	375.16	376.31	376.06	374.66	373.66	374.76	374.66	374.76	374.76
11.....	371.46	374.46	379.91	375.16	376.16	376.06	374.66	373.81	374.76	374.66	374.76	374.76
12.....	371.46	374.56	379.76	375.16	376.26	375.96	374.66	373 96	374.76	374.56	374.86	374.71
13.....	371.46	374.46	379.61	375.06	376.36	375.86	374.66	374.06	374.66	374.56	374.86	374.61
14.....	371.46	374.41	379.41	374.96	376.36	375.81	374.66	374.06	374.66	374.56	374.86	374.46
15.....	371.46	374.26	379.11	374.86	376 36	375.76	374.66	374.06	374.66	374.56	374.86	374.56
16.....	371.46	374.26	378.91	374.76	376.36	375.66	374.56	374.06	374.56	374.56	374.86	374.56
17.....	371.46	374.26	378.66	374.76	376.26	375.56	374.56	373.96	374.46	374.56	374.86	374.46
18.....	371.56	374.26	378 31	374.76	376.26	375.46	374.56	373.96	374.36	374.56	374.86	374.31
19.....	371.56	374.16	378.11	374.66	376.16	375.36	374.46	373.86	374.36	374.46	374.86	374.21
20.....	371.66	374.16	377.96	374.66	376.16	375.36	374.46	373.76	374.36	374.46	374.96	374.26
21.....	371.76	374.16	377.81	374.66	376.16	375.26	374.36	373.76	374.26	374.56	375.06	374.36
22.....	372.06	374.31	377.61	374.56	376.16	375.26	374.46	373.76	374.26	374.56	375.06	374.36
23.....	372.41	374.36	377.51	374.66	376.16	375.16	374.46	373.76	374.16	374.56	375.16	374.46
24.....	374.06	374.36	377.36	374.81	376.16	375.16	374.46	373.76	374.16	374.66	375.16	374.56
25.....	374.41	374.26	377.26	375.01	376.26	375.16	374.36	373.76	374.16	374.66	375.16	374.66
26.....	374.91	374.26	377.16	375.41	376.26	375.16	374.36	373.86	374.26	374.66	375.06	374.76
27.....	375.16	374.31	377.06	375.86	376.36	375.16	374.36	373.96	374.26	374.76	375.06	374.86
28.....	375 16	374.81	376.91	376.21	376.36	375.16	374.36	373.86	374.26	374.76	375.06	374.86
29.....	375.16	......	376.76	376 36	376.36	375.06	374.26	373.76	374.36	374.76	375.06	374.86
30.....	375.06	......	376.61	376.36	376.26	374.96	374.26	373.66	374.36	374.76	375.16	374.96
31.....	374.96	......	376.41	......	376.16	......	374.16	373.56	......	374.86	......	375.06

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River at Mosquito Poin Bridge, Port Byron, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	377.85	376.05	377.55	378.05	378.15	377.45	375.95	375.25	375.55	375.35	375.75	375.85
2.....	377.85	375.65	378.95	377.85	378.15	377.45	375.95	375.25	375.45	375.25	375.65	375.95
3.....	377.85	375.45	379.75	377.65	377.95	377.35	375.95	375.25	375.45	375.25	375.45	375.95
4.....	377.85	375.25	380.35	377.55	378.05	377.25	375.85	375.25	375.35	375.35	375.45	375.95
5.....	377.85	375.15	380.75	377.45	378.15	377.15	375.85	375.15	375.45	375.35	375.45	375.85
6.....	377.85	375.15	381.05	377.35	378.25	378.35	377.75	375.15	375.65	375.45	375.45	375.75
7.....	377.85	375.25	381.65	377.15	378.35	377.45	375.75	375.05	375.85	375.55	375.55	375.75
8.....	377.85	375.25	381.95	376.95	378.25	377.55	375.75	375.05	376.15	375.55	375.55	375.65
9.....	377.85	375.25	382.05	376.85	378.15	377.45	375.65	375.05	376.15	375.55	375.55	375.65
10.....	377.85	375.25	382.15	376.85	377.90	377.35	375.65	375.45	375.95	375.45	375.55	375.65
11.....	377.85	375.25	381.95	376.75	377.75	377.35	375.65	375.45	375.85	375.45	375.65	375.55
12.....	377.85	375.25	381.75	376.85	377.65	377.25	375.65	375.35	375.75	375.35	375.65	375.55
13.....	377.85	375.25	381.55	376.75	377.55	377.15	375.75	375.35	375.65	375.35	375.65	375.45
14.....	377.85	375.25	381.25	376.65	377.55	377.05	375.75	375.45	375.65	375.35	375.75	375.45
15.....	377.85	375.25	380.95	376.65	377.55	376.95	375.75	375.45	375.55	375.35	375.75	375.35
16.....	377.85	375.35	380.65	376.55	377.45	376.85	375.65	375.55	375.55	375.35	375.75	375.25
17.....	377.85	375.35	380.45	376.55	377.45	376.75	375.65	375.55	375.45	375.35	375.75	375.15
18.....	377.75	375.35	380.25	376.45	377.35	376.55	375.55	375.55	375.35	375.35	375.85	375.15
19.....	377.55	375.35	379.95	376.45	377.35	376.55	375.55	375.35	375.35	375.35	375.85	375.25
20.....	377.45	375.35	379.75	376.35	377.25	376.45	375.55	375.45	375.35	375.25	375.85	375.25
21.....	377.35	375.35	379.55	376.35	377.25	376.35	375.45	375.55	375.25	375.25	375.95	375.25
22.....	374.85	375.35	379.45	376.25	377.15	376.35	375.45	375.55	375.25	375.35	375.95	375.25
23.....	375.35	375.35	379.35	376.35	379.35	376.25	375.45	375.55	375.15	375.45	375.95	375.35
24.....	375.85	375.35	379.25	376.45	377.35	376.25	375.35	375.35	375.15	375.45	375.95	375.35
25.....	375.95	375.45	379.15	376.85	377.45	376.15	375.35	375.35	375.15	375.45	375.85	375.45
26.....	375.95	375.45	378.95	377.45	377.55	376.15	375.45	375.35	375.25	375.55	375.85	375.45
27.....	376.15	375.85	378.75	377.85	377.65	376.15	375.45	375.45	375.25	375.55	375.75	375.55
28.....	376.15	376.35	378.65	378.05	377.65	376.05	375.45	375.45	375.35	375.65	375.75	375.65
29.....	376.05	......	378.55	378.15	377.55	376.05	375.35	375.55	375.35	375.65	375.75	375.65
30.....	375.95	......	378.35	378.25	377.55	376.05	375.35	375.65	375.35	375.65	375.85	375.75
31.....	375.95	......	378.15	......	377.55	......	375.35	375.65	......	375.65	......	375.75

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River at N. Y. C. R. R. Bridge, near Fox Ridge, Savannah P. O., N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	376.90	378.20	379.80	380.20	380.80	379.50	378.30	377.50	377.50	377.60	377.90	378.40
2.....	376.90	378.10	380.90	380.10	380.70	379.50	378.30	377.50	377.70	377.60	378.00	378.30
3.....	376.90	378.00	381.50	380.00	380.80	379.40	378.20	377.50	377.70	377.60	377.90	378.20
4.....	376.90	377.90	382.00	379.90	380.90	379.40	378.10	377.40	377.80	377.70	377.80	378.20
5.....	376.80	377.80	382.40	379.80	380.90	379.50	378.00	377.40	377.90	377.80	377.80	378.20
6.....	376.80	377.80	382.70	379.70	380.80	379.70	377.90	377.40	378.00	377.90	377.90	378.10
7.....	376.80	377.60	383.00	379.70	380.70	379.80	377.90	377.40	378.20	377.90	378.00	378.10
8.....	376.70	377.80	383.20	379.60	380.50	379.90	378.00	377.30	378.30	377.90	377.90	378.10
9.....	376.70	377.90	383.30	379.60	380.40	379.90	377.90	377.30	378.30	377.80	378.00	378.00
10.....	376.70	378.00	383.30	379.50	380.30	379.80	377.90	377.50	378.20	377.80	378.00	378.00
11.....	376.70	377.90	383.20	379.40	380.20	379.70	377.80	377.50	378.10	377.80	378.10	378.00
12.....	376.60	377.80	383.00	379.40	380.10	379.60	377.80	377.70	378.00	377.70	378.10	377.90
13.....	376.60	377.90	382.80	379.30	380.00	379.40	377.90	377.70	377.90	377.70	378.00	377.90
14.....	376.60	378.00	382.70	379.30	379.90	379.30	377.80	377.60	377.80	377.60	378.00	377.80
15.....	376.60	378.00	382.50	379.20	379.80	379.30	377.70	377.70	377.70	377.50	378.10	377.80
16.....	376.60	378.10	382.30	379.30	379.80	379.20	377.60	377.70	377.60	377.50	378.10	377.70
17.....	376.60	378.20	382.00	379.20	379.70	379.20	377.60	377.60	377.60	377.60	378.00	377.70
18.....	376.70	378.30	381.80	379.20	379.80	379.10	377.50	377.60	377.70	377.60	378.10	377.70
19.....	376.80	378.30	381.70	379.10	379.70	379.10	377.50	377.50	377.70	377.70	378.20	377.70
20.....	377.00	378.30	381.60	379.00	379.60	379.00	377.50	377.50	377.60	377.70	378.20	377.60
21.....	377.30	378.40	381.50	379.00	379.60	378.90	377.40	377.40	377.60	377.80	378.20	377.60
22.....	377.50	378.40	381.40	378.90	379.60	378.90	377.40	377.40	377.50	377.80	378.20	377.60
23.....	377.80	378.40	381.30	379.00	379.50	378.80	377.50	377.50	377.50	377.80	378.10	377.70
24.....	378.40	378.50	381.20	379.10	379.50	378.70	377.50	377.70	377.60	377.90	378.10	377.80
25.....	378.80	378.50	381.20	380.20	379.70	378.60	377.60	377.70	377.50	377.90	378.00	377.80
26.....	378.90	378.50	381.10	380.50	379.90	378.60	377.60	377.60	377.40	378.00	378.00	377.80
27.....	378.80	378.60	380.90	380.80	379.90	378.50	377.60	377.50	377.40	378.00	378.10	377.80
28.....	378.70	378.80	380.70	381.00	379.80	378.50	377.60	377.40	377.50	377.90	378.20	377.90
29.....	378.60	......	380.60	381.10	379.70	378.40	377.50	377.30	377.50	377.90	378.30	377.90
30.....	378.50	......	380.50	381.00	379.60	378.40	377.50	377.40	377.60	377.90	378.30	377.90
31.....	378.40	......	380.30	......	379.60	......	377.50	377.40	......	377.80	......	378.00

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River at Foot of Cayuga Lake.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	381.92	381.67	382.57	383.67	383.07	383.17	382.47	382.32	382.32	382.37	381.97	381.42
2.....	382.07	381.67	383.12	383.57	383.17	383.07	382.47	382.32	382.27	382.07	381.97	381.37
3.....	382.07	381.67	383.47	383.52	382.97	383.02	382.47	382.37	382.42	382.37	381.97	381.42
4.....	382.02	381.72	383.72	383.52	383.17	383.02	382.17	383.37	382.32	382.42	381.67	381.47
5.....	381.87	381.67	384.07	383.47	383.32	383.02	382.32	382.27	382.37	382.22	381.57	381.37
6.....	382.12	381.67	384.37	383.37	383.37	383.02	382.37	382.37	382.42	382.17	381.62	381.37
7.....	382.17	381.72	384.92	383.27	383.37	383.02	382.42	382.32	382.42	382.17	381.67	381.37
8.....	382.02	381.77	385.02	383.17	383.37	383.02	382.32	382.37	382.47	382.32	381.62	381.37
9.....	382.07	381.67	384.97	383.07	383.27	383.02	382.37	382.42	382.42	382.17	381.57	381.37
10.....	382.02	381.62	385.07	382.97	383.32	382.97	382.37	382.47	382.32	382.12	381.57	381.37
11.....	382.07	381.57	385.02	382.97	383.27	382.97	382.32	382.37	382.47	382.17	381.57	381.37
12.....	382.02	381.57	385.02	382.97	383.22	383.02	382.32	382.37	382.42	382.17	381.57	381.27
13.....	382.07	381.67	384.97	382.97	383.17	383.02	382.32	382.37	382.32	382.17	381.57	381.27
14.....	382.07	381.67	384.87	382.92	383.17	382.92	382.32	382.42	382.37	382.12	381.57	381.27
15.....	382.07	381.67	384.87	382.82	383.17	382.87	382.37	382.42	382.37	382.17	381.57	381.27
16.....	382.07	381.67	384.72	382.87	383.12	382.82	382.27	382.42	382.32	381.97	381.47	381.47
17.....	381.97	381.67	384.62	382.97	383.17	382.77	382.27	382.47	382.32	382.07	381.47	381.47
18.....	381.87	381.72	384.57	382.62	383.12	382.72	382.27	382.47	382.32	382.07	381.47	381.37
19.....	381.97	381.82	384.47	382.57	382.92	382.72	382.27	382.27	382.27	382.17	381.47	381.37
20.....	381.87	381.72	384.42	382.67	383.02	382.72	382.32	382.37	382.32	381.97	381.47	381.37
21.....	381.87	381.77	384.42	382.52	382.97	382.67	382.32	382.32	382.27	381.97	381.67	381.37
22.....	381.57	381.72	384.35	382.57	383.02	382.67	382.32	382.37	382.27	381.97	381.47	381.27
23.....	381.87	381.72	384.27	382.57	383.12	382.67	382.32	382.42	382.32	381.97	381.47	381.37
24.....	381.77	381.72	384.32	382.57	382.97	382.57	382.37	382.47	382.32	381.87	381.37	381.27
25.....	381.62	381.92	384.22	382.97	383.07	382.57	382.37	382.47	382.32	381.97	381.37	381.27
26.....	381.62	381.92	384.12	383.17	383.07	382.62	382.32	382.22	382.27	381.97	381.27	381.37
27.....	381.67	381.87	383.77	383.12	383.12	382.62	382.37	382.32	382.37	381.97	381.37	381.27
28.....	381.67	382.07	384.07	383.02	383.07	382.57	382.32	382.32	382.32	381.97	381.37	381.17
29.....	381.67	......	383.97	383.32	383.17	382.57	382.37	382.27	382.27	381.97	381.52	381.17
30.....	381.67	......	383.92	383.22	383.17	382.52	382.22	382.32	382.37	381.97	381.47	381.17
31.....	381.67	......	383.82	......	383.17	......	382.27	382.42	......	381.97	......	381.17

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Cayuga Lake, at Ithaca, N. Y

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	381.31	381.95	382.75	383.95	383.25	383.45	382.85	382.55	382.55	382.45	382.05	381.76
2.....	381.25	381.95	383.35	383.85	383.35	383.45	382.85	382.55	382.55	382.65	382.05	381.76
3.....	381.25	381.85	383.65	383.75	383.35	383.45	382.85	382.55	382.65	382.55	382.25	381.76
4.....	381.30	381.95	383.85	383.65	383.45	383.35	382.85	382.65	382.65	382.45	382.25	381.76
5.....	381.25	382.05	384.15	383.65	383.45	383.35	382.85	382.65	382.65	382.45	382.25	381.76
6.....	381.25	382.15	384.45	383.55	383.55	383.35	382.85	382.65	382.65	382.45	382.05	381.76
7.....	*a*	382.05	384.65	383.55	383.55	383.25	382.75	382.55	382.85	382.55	382.05	381.76
8.....	*a*	382.05	385.05	383.45	383.55	383.25	382.75	382.55	382.75	382.45	381.95	381.76
9.....	*a*	382.05	385.15	383.35	383.55	383.25	382.75	382.55	382.85	382.45	381.95	381.76
10.....	*a*	382.05	385.15	383.35	383.55	383.25	382.75	382.55	382.65	382.45	381.95	381.76
11.....	*a*	382.05	385.25	383.35	383.55	383.25	382.75	382.55	382.65	382.35	381.95	381.76
12.....	*a*	382.05	385.15	383.25	383.45	383.25	382.75	382.55	382.65	382.45	382.05	381.76
13.....	*a*	382.05	385.15	383.25	383.45	383.25	382.75	382.55	382.65	382.35	381.85	381.76
14.....	*a*	382.05	385.25	383.15	383.45	383.25	382.65	382.55	382.75	382.35	381.85	381.76
15.....	*a*	382.05	385.15	383.15	383.35	383.15	382.65	382.55	382.65	382.35	381.85	381.76
16.....	*a*	382.05	385.05	383.05	383.35	383.15	382.65	382.55	382.65	382.35	381.85	381.76
17.....	*a*	382.05	385.05	382.85	383.25	383.15	382.65	382.55	382.65	382.35	381.85	381.76
18.....	*a*	382.05	384.85	382.85	383.25	383.15	382.75	382.55	382.65	382.25	381.85	381.76
19.....	*a*	382.05	384.65	382.75	383.25	383.25	382.75	382.55	382.65	382.25	381.85	381.76
20.....	*a*	382.05	384.55	382.75	383.15	383.25	382.65	382.55	382.65	382.25	381.85	381.76
21.....	*a*	382.05	384.55	382.75	383.15	383.15	382.65	382.55	382.65	382.15	381.85	381.76
22.....	*a*	382.05	384.55	382.75	383.15	383.15	382.65	382.55	382.65	382.15	381.85	381.76
23.....	*a*	382.05	384.55	382.65	383.25	383.15	382.65	382.55	382.65	382.25	381.85	381.76
24.....	*a*	382.05	384.45	382.75	383.35	383.15	382.65	382.55	382.65	382.15	381.76	381.76
25.....	*a*	382.05	384.45	382.85	383.25	383.15	382.75	382.55	382.55	382.15	381.76	381.76
26.....	381.95	382.05	384.45	383.05	383.25	383.05	382.75	382.65	382.55	382.15	381.85	381.76
27.....	381.95	382.05	384.35	383.05	383.45	383.05	382.65	382.55	382.55	382.25	381.76	381.76
28.....	381.95	382.05	384.15	383.15	383.45	383.05	382.65	382.55	382.55	382.15	381.76	381.76
29.....	382.05	......	384.15	383.15	383.45	382.95	382.55	382.55	382.55	382.25	381.76	381.76
30.....	381.95	......	384.05	383.25	383.45	382.95	382.65	382.55	382.55	382.15	381.76	381.76
31.....	381.95	......	383.95	......	383.45	......	382.65	382.45	......	382.15	......	381.76

a No record.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River above Mud Lock, near Seneca Falls, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	385.93	386.53	386.18	386.51	386.88	387.01	385.31	386.11	385.98	386.38	386.61	386.61
2	386.08	386.48	385.83	386.48	386.91	387.03	385.23	386.11	385.03	386.28	386.38	386.61
3	386.01	386.53	386.23	386.35	387.05	386.98	385.05	386.03	385.88	386.48	386.35	386.55
4	385.78	386.53	386.23	386.51	387.01	386.98	384.93	386.03	385.95	386.45	386.35	386.25
5	385.91	386.53	386.21	386.41	387 08	386.98	385.13	386.11	386.03	386.43	386.33	386.68
6	386.03	386.16	386.11	386.51	387.05	387.01	385.13	385.85	386.33	386.51	385.83	386.53
7	386.11	386.45	385 83	386.41	387.08	386.95	385.38	385.81	386.23	386.53	386.31	386.55
8	386.31	386.51	386 45	386.41	386.98	386.95	385.48	386.05	386.11	386.51	386.48	386.53
9	386.23	386.53	386.38	386.35	387.08	386.95	385.35	385.88	386.15	386.33	386.48	386.43
10	386.03	386.23	386.35	386.31	387.08	387.01	385.23	385.93	386.03	386.38	386.48	386.38
11	386.08	386.35	386.41	386.43	387.01	387.01	385.25	385.81	385.95	386.43	386.53	386.18
12	386.11	386.43	386.48	386.41	387.05	386.95	385.43	386.03	386.05	386.55	386.53	386.68
13	386.13	386.28	386.55	386.38	387.03	386.83	385.45	385.78	386.11	386.51	386.65	386.68
14	386.18	386.48	386.58	386.38	387.03	386.93	385.28	385.78	386.11	386.35	386.61	386.68
15	386.11	386.51	386.55	386.51	386.93	386.95	385.43	385.85	386.11	386.48	386.65	386.68
16	386.03	386.55	386.55	386.61	386.98	386.88	385.31	385.85	386.11	386.18	386.43	386.63
17	386.18	386.53	386.53	386.55	386.98	386.88	385.08	385.85	386.11	386.31	386.61	386.61
18	386.28	386.53	386.55	386.58	387.01	386.88	385.33	385.93	385.85	386.43	386.61	386.41
19	386.21	386.28	386.55	386.15	386.95	386.33	385.31	385.78	386.33	383.35	386.53	386.68
20	386.23	386.45	386.53	386.63	387.05	386.33	385.23	385.78	386.33	386.58	386.48	386.58
21	386.23	386.63	386.58	383.15	387.05	385.63	385.25	385.78	386.35	383.55	386.61	386.68
22	386.28	386.58	386.58	385.73	383.93	385.58	385.23	385.91	386.35	383.58	383.53	386.68
23	386.11	386.55	386.35	386.21	387.01	385.48	384.98	385.93	386.35	386.03	386.51	386.68
24	386.33	386.25	386.43	386.71	386.98	385.31	385.11	385.85	386.23	386.23	386.38	386.68
25	386.41	385.91	386.53	387 03	386.98	385.25	385.15	385.91	386.05	386.31	386.53	386.35
26	386.46	385.75	386.48	387.05	387.08	385.21	385.13	385.95	386.23	386.31	386.51	386.48
27	386.46	385.98	386.43	386.93	387.05	385.41	385.15	385.78	386.35	386.38	386.28	386.68
28	386.51	385.98	386.51	386.88	387.01	385.31	385.18	385.78	386.31	386.35	386.53	386.68
29	386.53	......	386.45	386.93	387.01	385.18	385.15	385.93	386.45	386.38	386.51	386.68
30	386.28	......	386.48	386.95	383.91	385.23	385.11	385.91	386.48	386.05	386.55	386.68
31	386.48	......	386.51	......	387.03	......	384.91	385.98	......	386.48	......	386.68

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River below Lock No. 7, at Seneca Falls, N. Y.

DAY.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.*					
1	......	*a*	386.51	386.66	386.26
2	......	386.51	386.56	386.61	385.96
3	......	386.61	386.41	386.61	386.21
4	......	386.46	386.56	386.66	386.31
5	......	386.41	386.46	386.61	386.01
6	......	386.41	386.51	386.56	386.21
7	386.91	386.51	386.41	386.36	386.16
8	386.38	386.61	386.41	386.56	386.36
9	*a*	386.56	386.41	386.61	386.31
10	*a*	386.51	386.41	386.66	386.26
11	*a*	386.41	386 46	386.66	386.21
12	386.61	386.31	386.66	386.66	386.01
13	386.86	386.56	386.76	386.56	386.01
14	386.91	386.61	386.66	386.51	386.21
15	386.91	386.41	386.61	386.61	386.31
16	386.91	386.56	386.61	386.61	386.31
17	386.81	386.61	386.51	386.46	386.16
18	386.76	386.56	386.61	386.31	386.21
19	*a*	386.36	386.71	386.31	385.91
20	386.81	386.41	386.66	386.31	386.01
21	*a*	387.01	386.81	386.11	386.16
22	386.45	386.46	386.76	386.31	386.01
23	386.56	386.56	386.66	386.21	386.16
24	386.66	386.66	386.56	386.21	386.11
25	386.66	386.51	386.71	386.01	385.76
26	386.71	386.41	386.76	386.16	385.71
27	386.76	386.61	386.66	386.21	385.96
28	386.56	386.61	386.61	386.01	386.06
29	385.51	386.56	386.56	386.01	386.01
30	386.61	386.71	386.66	386.31	385.96
31	386.51	......	386.51	......	385.71

a No record. * This table supersedes that on page 416 of 1909 report.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River below Lock No. 7 at Seneca Falls, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	385.96	386.61	387.26	386.56	387.16	387.41	386.21	386.91	387.51	387.46	387.11	386.86
2	385.76	386.61	387.61	386.61	387.26	387.36	386.51	386.96	387.41	387.21	386.81	386.91
3	386.06	386.51	387.31	386.41	387.46	387.21	386.26	386.96	387.16	387.31	386.86	386.86
4	385.81	386.56	387.21	386.61	387.66	387.21	386.16	386.86	387.36	387.51	386.86	386.61
5	386.06	386.56	387.01	386.61	387.41	387.21	386.41	386.91	387.36	387.41	386.86	386.86
6	386.01	386.21	386.71	386.51	387.41	387.36	386.61	386.76	387.86	387.46	386.26	386.71
7	386.11	386.61	387.51	386.51	387.41	387.26	386.61	386.66	387.61	387.41	386.81	386.71
8	385.91	386.81	386.66	386.46	387.41	387.21	386.76	386.86	387.61	387.41	386.71	386.71
9	385.56	386.81	386.56	386.51	387.41	387.21	386.51	386.91	387.71	386.96	387.01	386.81
10	386.16	386.66	386.56	386.51	387.41	387.21	386.56	386.56	387.41	386.31	387.01	386.76
11	386.11	386.61	386.56	386.51	387.41	387.21	386.56	386.86	387.16	387.46	387.06	386.51
12	386.11	386.51	386.61	386.51	387.41	387.21	386.81	386.76	387.51	387.46	386.96	387.01
13	386.31	386.41	386.61	386.51	387.41	387.21	386.76	386.86	387.41	387.26	386.76	387.06
14	386.16	386.46	386.61	386.56	387.41	387.21	386.71	386.71	387.51	387.26	387.11	387.06
15	386.06	386.41	386.56	386.56	387.21	387.11	386.81	387.06	387.36	387.21	387.26	387.11
16	385.81	386.51	386.61	386.71	387.21	387.06	386.71	386.96	387.36	387.01	386.86	387.11
17	386.06	386.51	386.61	386.56	387.36	387.11	386.46	387.06	387.31	387.06	387.16	387.16
18	386.26	386.41	386.61	386.76	387.36	387.06	386.76	387.01	386.96	387.21	387.06	386.61
19	386.36	386.41	386.61	386.71	387.36	386.96	386.66	386.96	386.81	387.21	387.06	387.11
20	386.41	386.21	386.71	386.76	387.31	387.01	386.71	386.86	386.26	387.31	386.81	386.96
21	386.41	386.51	386.71	386.81	387.21	386.86	386.51	386.71	387.31	387.26	386.91	386.91
22	386.26	386.51	386.71	386.91	387.06	386.81	386.71	387.06	387.36	387.31	386.91	386.91
23	386.01	386.41	386.41	386.81	387.31	386.76	386.61	387.31	387.36	386.86	386.91	386.81
24	386.31	386.21	386.61	386.81	387.21	386.61	386.31	387.06	387.41	387.01	386.41	386.96
25	386.41	385.41	386.61	387.56	387.41	386.41	386.66	387.26	386.91	386.91	386.91	386.41
26	386.41	385.41	386.61	387.31	387.41	386.31	386.61	387.31	387.36	386.91	386.86	386.61
27	386.41	385.81	386.31	387.31	387.36	386.46	386.76	387.06	387.41	386.91	386.46	386.91
28	386.51	386.21	386.61	387.21	387.36	386.46	386.86	387.01	387.41	386.96	386.91	386.91
29	386.56	......	386.61	387.21	387.21	386.46	386.81	387.26	387.56	387.01	386.96	386.91
30	386.36	......	386.61	387.21	387.26	386.41	386.86	387.26	387.51	386.51	386.96	386.91
31	386.51	......	386.66	......	387.26	......	386.66	387.41	......	387.01	......	386.81

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River below Lock No. 6, at Seneca Falls, N. Y.

DAY.	Nov.	Dec.
1909.*		
1	......	392.03
2	......	392.03
3	......	392.04
4	......	392.07
5	......	391.91
6	......	392.05
7	......	392.02
8	......	392.03
9	......	392.05
10	......	392.03
11	......	392.00
12	......	391.91
13	......	392.00
14	......	392.06
15	......	392.05
16	392.15	392.07
17	392.16	392.05
18	392.05	392.00
19	392.09	391.89
20	391.99	392.01
21	391.91	391.93
22	392.01	391.83
23	391.99	391.85
24	392.01	391.87
25	391.96	391.65
26	391.99	391.64
27	391.93	391.89
28	391.91	391.87
29	392.03	391.83
30	392.05	391.85
31	......	391.87

* This table supersedes that on page 417 of 1909 report.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River below Lock No. 6, at Seneca Falls, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	391.86	392.13	392.16	392.26	392.51	392.61	392.41	392.51	392.56	392.61	392.56	392.31
2	391.66	392.13	391.41	392.26	392.61	392.61	392.46	392.51	392.51	392.56	392.46	392.26
3	391.83	392.13	391.81	392.11	392.66	392.51	392.31	392.51	392.51	392.61	392.46	392.26
4	391.75	392.10	392.23	392.21	392.81	392.51	392.26	392.51	392.51	392.61	392.46	392.11
5	392.07	392.09	392.17	392.21	392.71	392.51	392.41	392.51	392.56	392.61	392.51	392.21
6	391.92	391.76	391.87	392.21	392.61	392.61	392.51	392.46	392.61	392.61	392.41	392.21
7	391.93	392.33	391.93	392.21	392.61	392.61	392.51	392.36	392.61	392.61	392.51	392.21
8	392.03	392.21	391.97	392.21	392.61	392.51	392.51	392.51	392.61	392.61	392.46	392.21
9	391.91	392.11	391.89	392.21	392.61	392.51	392.46	392.51	392.51	392.51	392.56	392.21
10	391.92	391.93	391.86	392.21	392.61	392.51	392.41	392.51	392.51	392.56	392.51	392.01
11	391.99	392.06	391.87	392.16	392.61	392.51	392.41	392.51	392.41	392.61	392.46	391.61
12	391.89	392.01	392.03	392.16	392.61	392.51	392.46	392.51	392.51	392.61	392.46	391.86
13	391.91	391.91	392.13	392.16	392.61	392.51	392.36	392.51	392.51	392.51	392.41	392.06
14	391.94	392.03	392.15	392.16	392.61	392.51	392.41	392.41	392.56	392.56	392.51	392.06
15	391.89	392.01	392.12	392.16	392.56	392.41	392.41	392.51	392.51	392.56	392.56	392.16
16	391.71	392.03	392.16	392.21	392.61	392.41	392.46	392.51	392.51	392.56	392.46	392.11
17	391.93	392.01	392.16	392.16	392.61	392.41	392.41	392.56	392.56	392.56	392.51	392.16
18	391.93	392.01	392.16	392.21	392.61	392.31	392.51	392.51	392.51	392.56	392.51	391.61
19	391.90	391.97	392.16	392.21	392.61	392.26	392.46	392.46	392.51	392.56	392.51	392.06
20	391.91	391.86	392.18	392.26	392.61	392.36	392.51	392.46	392.56	392.61	392.46	392.01
21	392.03	392.06	392.18	392.26	392.51	392.56	392.46	392.41	392.51	392.61	392.41	391.96
22	392.00	392.06	392.23	392.26	392.41	392.51	392.46	392.51	392.51	392.56	392.46	391.96
23	391.91	392.04	392.23	392.26	392.61	392.41	392.61	392.51	392.51	392.51	392.26	392.01
24	392.07	391.91	392.24	392.21	392.61	392.46	392.81	392.56	392.56	392.16	392.01	391.96
25	392.13	391.71	392.21	392.76	392.66	392.41	392.66	392.56	392.51	392.01	392.21	391.56
26	392.12	391.71	392.21	392.61	392.61	392.41	392.46	392.61	392.56	392.06	392.16	391.61
27	392.13	391.91	*a*	392.61	392.61	392.41	392.51	392.51	392.56	392.06	392.01	391.91
28	392.13	391.91	*a*	392.61	392.56	392.46	392.51	392.46	392.61	392.56	392.21	391.96
29	392.17	......	392.21	392.56	392.51	392.46	392.41	392.51	392.61	392.51	392.31	392.06
30	391.97	......	392.31	392.61	392.61	392.41	392.46	392.51	392.56	392.51	392.31	392.01
31	392.12	......	392.31	......	392.56	......	392.46	392.56	......	392.56	......	392.01

a No record.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River above Seneca Falls, N. Y.

DAY.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.*					
1	......	429.59	429.59	429.64	429.64
2	......	429.59	429.59	429.69	429.69
3	......	429.59	429.59	429.64	429.69
4	......	*a*	429.59	429.69	429.69
5	......	*a*	429.69	429.64	429.59
6	429.69	*a*	429.64	429.69	429.69
7	429.71	429.59	429.59	429.64	429.69
8	429.59	429.59	429.59	429.59	429.69
9	429.59	429.59	429.59	429.69	429.69
10	429.24	429.54	429.59	429.64	429.84
11	428.43	429.59	429.64	429.64	429.69
12	429.54	429.49	429.69	429.69	429.64
13	429.59	429.54	429.69	429.69	429.64
14	429.69	429.59	429.64	429.59	429.69
15	429.59	429.49	429.64	429.64	429.69
16	429.59	429.59	429.64	429.69	429.69
17	429.59	429.59	429.64	429.69	429.64
18	429.59	429.59	429.69	429.69	429.74
19	429.59	429.59	429.64	429.74	429.59
20	429.59	429.64	429.69	429.64	429.64
21	429.59	429.59	429.69	429.59	429.64
22	429.59	429.64	429.69	429.69	429.69
23	429.59	429.64	429.64	429.69	429.64
24	429.56	429.59	429.59	429.69	429.64
25	429.59	429.59	429.64	429.69	429.49
26	429.54	429.59	429.69	429.69	429.54
27	429.59	429.59	429.69	429.64	429.59
28	429.59	429.59	429.64	429.59	429.64
29	429.59	429.59	429.64	429.64	429.52
30	429.59	429.59	429.64	429.69	429.59
31	429.59	......	429.59	......	429.49

a No record. * This table supersedes that on page 418 of 1909 report.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River above Seneca Falls, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	429.69	429.69	429.89	429.79	429.89	429.99	429.79	429.59	429.69	429.74	429.84	429.74
2.....	429.64	429.69	430.02	429.79	429.99	429.99	429.79	429.61	429.69	429.69	429.89	429.87
3.....	429.69	429.69	429.99	429.74	430.04	429.94	429.79	429.64	429.69	429.77	429.84	429.81
4.....	429.49	429.74	429.94	429.79	430.09	429.94	429.79	429.69	429.79	429.77	429.64	429.74
5.....	429.64	429.74	429.89	429.79	430.09	429.94	429.79	429.69	429.84	429.81	429.69	429.84
6.....	429.59	429.54	429.84	429.84	430.09	429.94	429.79	429.64	429.89	429.84	*a*	429.79
7.....	429.64	429.74	429.94	429.79	430.09	429.94	429.79	429.59	429.77	429.84	*a*	429.84
8.....	429.54	429.69	429.79	429.79	429.99	429.94	429.79	429.59	429.74	429.77	*a*	429.79
9.....	429.44	429.79	429.79	429.74	429.99	429.89	429.79	429.59	429.74	429.69	429.79	429.81
10.....	429.59	429.64	429.79	429.94	429.99	429.89	429.79	429.64	429.69	429.79	429.61	429.74
11.....	429.64	429.54	429.79	429.74	429.99	429.91	429.74	429.64	429.69	429.87	429.54	429.61
12.....	429.64	429.69	429.79	429.69	430.04	429.89	429.69	429.59	429.74	429.89	429.74	429.79
13.....	429.69	429.59	429.79	429.79	429.99	429.89	429.59	429.59	429.74	429.89	429.69	429.79
14.....	429.64	429.64	429.79	429.79	429.99	429.89	429.59	429.59	429.74	429.84	429.84	429.84
15.....	429.64	429.69	429.79	429.74	429.99	429.89	429.59	429.59	429.74	429.74	429.89	429.79
16.....	429.59	429.69	429.79	429.79	429.94	429.89	429.59	429.59	429.69	429.59	429.81	429.79
17.....	*a*	429.79	429.79	429.59	429.89	429.89	429.59	429.50	429.60	429.79	429.89	429.69
18.....	*a*	429.74	429.79	429.74	429.94	429.89	429.59	429.59	429.61	429.87	429.81	429.69
19.....	429.69	429.74	429.89	429.74	429.89	429.84	429.59	429.69	429.74	429.79	429.71	429.77
20.....	429.69	429.74	429.79	429.79	429.89	429.79	429.59	429.69	429.77	429.87	429.61	429.69
21.....	429.64	429.64	429.84	429.79	429.94	429.79	429.59	429.69	429.79	429.91	429.84	429.74
22.....	429.49	429.69	429.79	429.79	429.99	429.79	429.59	429.69	429.77	429.81	429.69	429.74
23.....	429.59	429.74	429.79	429.79	429.09	429.79	429.59	429.69	429.77	429.61	429.87	429.77
24.....	429.60	429.59	429.79	429.79	429.94	429.79	429.59	429.69	429.74	429.87	429.81	429.69
25.....	429.69	429.69	429.79	430.04	429.94	429.79	429.59	429.69	429.37	429.81	429.84	429.69
26.....	429.69	429.74	429.79	429.94	429.99	429.79	429.59	429.69	429.79	429.79	429.74	429.69
27.....	429.69	429.69	429.69	429.94	429.99	429.79	429.59	429.69	429.79	429.84	429.61	429.74
28.....	429.69	429.84	429.79	429.89	429.99	429.79	429.59	429.69	429.74	429.87	429.89	429.74
29.....	429.69	......	429.79	429.94	429.99	429.79	429.59	429.69	429.79	429.77	429.91	429.77
30.....	429.59	......	429.79	429.94	429.99	429.79	429.59	429.69	429.74	429.59	429.87	429.81
31.....	429.69	......	429.79	......	429.99	......	429.59	429.69	......	429.84	......	429.69

a No record.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River below Waterloo, N. Y

DAY.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.*					
1	......	430.53	430.53	430.33	430.03
2	......	430.58	430.53	430.33	430.08
3	......	430.63	430.43	430.33	430.08
4	......	430.58	430.53	430.28	430.08
5	......	430.48	430.58	430.28	429.73
6	......	430.53	430.43	430.33	430.03
7	......	430.63	430.43	430.18	430.03
8	......	430.58	430.43	430.18	430.08
9	......	430.58	430.43	430.28	430.03
10	......	430.58	430.38	430.28	429.98
11	429.68	430.58	430.43	430.28	429.98
12	430.28	430.48	430.38	430.18	429.63
13	430.43	430.53	430.48	430.28	429.83
14	430.43	430.48	430.43	430.03	429.98
15	430.23	430.43	430.43	430.13	429.98
16	430.43	430.48	430.43	430.18	429.98
17	430.38	430.48	430.28	430.13	429.88
18	430.43	430.48	430.43	430.18	429.88
19	430.43	430.53	430.38	430.18	429.63
20	430.48	430.58	430.43	430.18	429.83
21	430.53	430.58	430.43	429.93	429.88
22	430.43	430.63	430.43	430.13	429.93
23	430.43	430.48	430.38	430.13	429.88
24	430.53	430.58	430.23	430.08	429.88
25	430.48	430.58	430.33	429.98	429.68
26	430.63	430.43	430.38	430.03	429.53
27	430.58	430.53	430.28	430.08	429.78
28	430.43	430.63	430.28	429.73	429.88
29	430.58	430.58	430.33	430.08	429.88
30	430.53	430.58	430.43	430.03	429.78
31	430.48	......	430.13	......	429.78

* This table supersedes that on page 419 of 1909 report.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River below Waterloo, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	429.88	429.93	430.13	429.83	430.33	430.48	429.98	430.83	431.03	430.88	430.38	430.33
2	429.53	429.88	430.33	429.88	430.58	430.53	430.03	430.88	431.03	430.63	430.28	430.28
3	429.78	429.98	430.28	429.83	430.58	430.48	429.93	430.88	431.13	430.88	430.18	430.18
4	429.63	429.98	430.33	429.98	430.88	430.43	429.93	430.88	430.98	430.88	430.18	430.13
5	429.78	429.78	430.08	429.98	430.83	430.33	429.98	430.93	430.93	430.88	430.28	430.13
6	429.78	429.63	430.08	429.98	430.78	430.43	430.08	430.88	431.38	430.83	430.03	430.18
7	429.88	429.83	430.28	429.98	430.78	430.53	430.08	430.88	431.23	430.68	430.23	430.23
8	429.58	429.88	430.18	429.98	430.63	430.38	430.08	430.98	431.23	430.78	430.33	430.08
9	429.48	429.88	429.98	429.98	430.68	430.38	430.03	430.98	431.33	430.53	430.13	430.18
10	429.73	429.68	429.98	*a*	430.58	430.38	429.98	430.98	431.18	430.68	430.23	430.18
11	429.83	429.78	429.98	429.98	430.58	430.38	430.18	430.88	431.03	430.73	430.18	430.03
12	429.88	429.78	429.98	429.98	429.58	430.33	430.13	430.93	431.18	430.73	430.28	430.08
13	429.88	429.68	429.78	429.98	430.58	430.43	430.18	431.03	431.18	430.68	430.08	430.13
14	429.78	429.78	429.98	429.98	430.58	430.38	430.23	430.93	431.13	430.58	430.13	430.23
15	429.78	429.93	429.88	429.88	430.53	430.38	430.38	430.98	431.18	430.43	430.23	430.18
16	429.63	429.98	429.88	429.83	430.58	430.38	430.33	430.98	431.08	430.18	430.13	430.03
17	429.88	429.98	429.98	429.78	430.58	430.28	430.23	431.08	430.98	430.43	430.23	430.03
18	429.88	429.88	429.98	429.88	430.58	430.28	430.48	431.03	430.68	430.63	430.13	429.93
19	429.78	429.88	429.98	429.98	430.38	430.13	430.28	431.13	430.93	430.48	430.13	430.13
20	429.78	429.68	429.93	429.93	430.48	430.23	430.43	430.98	431.03	430.48	430.03	430.18
21	429.88	429.93	429.98	429.78	430.38	430.18	430.38	430.93	430.98	430.53	430.03	430.08
22	429.98	429.98	430.08	429.78	430.33	430.13	430.43	431.03	430.93	430.43	430.23	430.23
23	429.58	429.98	430.08	429.78	430.43	430.08	430.33	431.13	431.03	430.08	430.13	430.03
24	429.88	429.93	430.08	429.73	430.38	430.03	430.28	431.03	430.88	430.38	430.18	429.98
25	429.88	429.93	429.93	430.53	430.38	429.98	430.48	431.13	430.43	430.43	430.23	429.88
26	429.88	429.93	429.93	430.53	430.48	429.93	430.53	431.18	430.93	430.33	430.13	429.78
27	429.98	429.58	429.83	430.53	430.48	429.98	430.63	431.08	431.03	430.28	430.08	429.98
28	429.88	429.93	429.88	430.48	430.38	429.98	430.93	430.93	430.78	430.28	430.28	429.88
29	429.78	......	429.98	430.48	430.33	429.98	430.78	431.03	430.98	430.28	430.33	429.93
30	429.63	......	429.98	430.48	430.43	430.03	430.78	431.13	430.93	430.08	430.38	429.88
31	429.93	......	429.98	......	430.48	......	430.83	431.08	......	430.28	......	429.93

a No record.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River above Waterloo, N. Y.

DAY.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.*					
1	......	444.22	444.02	444.22	444.02
2	......	444.12	444.07	444.17	444.07
3	......	443.97	444.12	444.22	443.97
4	......	444.02	443.97	444.22	443.97
5	......	444.22	443.97	444.07	444.47
6	......	444.12	444.02	444.12	444.02
7	......	443.87	444.12	444.52	443.97
8	......	443.82	444.07	444.32	443.97
9	......	443.87	444.27	444.12	443.92
10	......	443.92	444.27	444.17	444.02
11	444.77	443.92	444.17	444.17	443.87
12	444.82	444.27	444.12	444.27	444.27
13	444.52	444.17	444.02	444.12	444.12
14	444.42	443.97	444.22	444.42	443.97
15	444.82	444.52	444.17	444.32	443.87
16	444.72	444.17	444.12	444.07	443.92
17	444.42	444.07	444.47	444.27	444.02
18	444.42	443.87	444.17	444.17	443.92
19	444.42	444.02	444.02	444.12	444.37
20	444.37	444.07	443.97	444.07	444.02
21	444.32	444.02	444.02	444.37	443.87
22	444.47	444.02	444.07	444.07	443.92
23	444.47	444.02	444.22	444.07	443.92
24	444.32	444.02	444.42	443.92	443.82
25	444.32	444.02	444.22	444.37	444.22
26	444.17	444.22	444.02	444.22	444.27
27	444.12	444.02	444.37	444.12	434.82
28	444.32	443.82	444.32	444.57	443.97
29	444.32	444.12	444.17	444.07	443.87
30	444.17	444.02	444.07	444.02	443.92
31	444.22	......	444.47	......	443.92

* This table supersedes that on page 420 of 1909 report.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River above Waterloo, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	443.82	443.82	444.72	446.12	446.57	446.52	445.77	444.62	444.22	445.07	445.17	445.32
2.....	443.92	443.92	445.17	446.12	446.52	446.52	445.57	444.52	444.12	445.22	445.17	445.22
3.....	443.77	443.82	445.27	446.17	446.62	446.47	445.77	444.62	444.17	444.92	445.32	445.52
4.....	443.77	443.92	445.52	446.07	446.72	446.42	445.82	444.77	444.42	445.02	445.12	445.72
5.....	443.87	444.07	445.77	446.07	446.62	446.47	445.47	444.42	444.47	444.97	445.22	445.17
6.....	443.72	444.17	445.87	446.07	446.52	446.42	445.47	444.47	444.52	444.97	445.42	445.07
7.....	443.82	443.92	446.02	446.07	446.52	446.42	445.47	444.67	444.57	444.92	445.22	444.97
8.....	443.87	443.82	446.07	446.02	446.57	446.47	445.42	444.22	444.52	445.02	445.22	444.97
9.....	444.32	443.87	446.07	446.07	446.52	446.37	445.62	444.12	444.57	445.37	445.12	445.02
10.....	443.82	444.07	446.07	446.17	446.52	446.37	445.72	444.27	444.62	444.97	445.17	445.17
11.....	443.72	443.82	446.07	446.07	446.52	446.37	445.42	444.32	444.92	444.92	445.27	445.02
12.....	443.72	443.82	446.17	446.07	446.52	446.47	445.27	444.17	444.72	444.87	445.37	444.97
13.....	443.82	444.12	446.17	446.07	446.52	446.37	445.47	444.42	444.67	444.87	445.52	444.87
14.....	443.72	443.92	446.07	445.97	446.47	446.37	445.47	444.47	444.72	445.02	445.27	444.67
15.....	443.77	443.82	446.07	446.07	446.57	446.27	445.22	444.22	444.77	445.07	445.17	444.72
16.....	444.02	443.82	446.17	446.07	446.52	446.17	445.42	444.17	444.92	445.57	445.27	444.62
17.....	443.72	443.72	446.07	446.17	446.52	446.17	445.67	444.22	445.02	445.12	445.22	444.87
18.....	443.82	443.82	446.07	446.07	446.52	446.17	445.47	444.22	445.42	445.07	445.12	444.82
19.....	443.72	443.92	446.07	446.02	446.52	446.27	445.37	444.07	445.12	445.07	445.32	444.52
20.....	443.72	444.12	446.17	446.07	446.52	446.12	445.32	444.42	445.17	444.97	445.52	444.47
21.....	443.82	443.87	446.07	446.07	446.52	446.12	445.57	444.57	445.07	444.97	445.17	444.62
22.....	444.07	443.87	446.17	446.07	446.67	446.12	445.47	444.77	444.97	445.22	445.27	444.52
23.....	444.32	443.92	446.07	446.07	446.52	446.07	445.42	444.12	445.12	445.32	445.22	444.57
24.....	443.92	443.87	446.07	446.17	446.52	446.07	445.62	444.17	445.02	445.12	445.12	444.62
25.....	443.82	443.82	446.17	446.47	446.57	446.02	445.47	444.12	445.42	445.12	445.27	444.82
26.....	443.82	443.92	446.22	446.37	446.57	446.17	445.17	444.07	445.17	445.22	445.27	444.87
27.....	443.92	444.27	446.27	446.27	446.57	446.02	444.92	444.37	444.92	445.27	445.52	444.52
28.....	443.82	443.97	446.27	446.37	446.52	446.02	444.77	444.57	444.97	445.22	445.37	444.52
29.....	444.07	......	446.12	446.37	446.57	445.92	444.62	444.22	444.87	445.32	445.42	444.57
30.....	444.27	......	446.12	446.37	446.57	445.92	444.77	444.12	444.92	445.47	445.47	444.52
31.....	443.87	......	446.12	......	446.52	......	444.82	444.17	......	445.22	......	444.52

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River below Guard-lock near Geneva, N. Y.

DAY.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.*					
1	......	446.58	446.28	445.58	445.13
2	......	446.48	446.18	445.58	445.13
3	......	446.58	446.18	445.58	445.13
4	......	446.58	446.18	445.58	445.13
5	446.83	446.58	446.18	445.48	445.13
6	446.78	446.48	446.18	445.48	445.23
7	446.78	446.48	446.18	445.58	445.23
8	446.83	446.48	446.08	445.58	445.13
9	446.83	446.43	446.08	445.48	445.23
10	446.73	446.48	446.08	445.48	445.13
11	446.73	446.48	446.08	445.58	445.03
12	446.73	446.53	446.08	445.58	445.03
13	446.68	446.48	446.08	445.48	445.13
14	446.73	446.48	446.18	445.48	445.13
15	446.83	446.48	445.98	445.48	445.13
16	446.83	446.38	445.98	445.38	445.03
17	446.78	446.38	445.98	445.38	445.03
18	446.78	446.38	445.88	445.38	445.03
19	446.78	446.38	445.88	445.38	445.03
20	446.78	446.48	445.88	445.38	445.03
21	446.68	446.38	445.78	445.38	445.03
22	446.88	446.38	445.73	445.38	444.93
23	446.68	446.38	445.78	445.28	444.93
24	446.78	446.28	445.78	445.28	444.93
25	446.78	446.38	445.78	445.18	444.93
26	446.68	446.28	445.78	445.18	444.93
27	446.68	446.28	445.78	445.18	444.93
28	446.68	446.28	445.78	445.38	444.73
29	446.68	446.28	445.68	445.38	444.73
30	446.58	446.28	445.58	445.13	444.73
31	446.68	......	445.58	......	444.73

* This table supersedes that on page 421 of 1909 report.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River below Guard-lock, near Geneva, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	444.73	444.63	444.93	446.53	447.43	447.63	447.33	447.13	446.73	446.63	446.03	445.53
2......	444.63	444.63	445.33	446.53	447.43	447.63	447.33	447.13	446.73	447.03	446.03	445.53
3......	444.63	444.73	445.43	446.53	447.63	447.63	447.33	447.03	446.73	446.53	445.93	445.53
4......	444.63	444.73	445.93	446.53	447.63	447.63	447.33	447.03	446.83	446.53	445.93	445.53
5......	444.63	444.73	446.03	446.53	447.63	447.53	447.23	447.03	446.73	446.43	445.93	445.43
6......	444.63	445.73	446.13	446.53	447.63	447.63	447.33	446.93	446.83	446.43	445.93	445.43
7......	444.63	445.73	446.43	446.53	447.63	447.63	447.33	446.93	446.83	446.43	445.93	445.43
8......	444.63	445.73	446.43	446.53	447.63	447.63	447.33	446.93	446.93	446.43	445.93	445.33
9......	444.63	445.53	446.43	446.53	447.63	447.53	447.33	447.03	446.83	446.43	445.93	445.33
10......	444.63	444.63	446.43	446.43	447.63	447.53	447.33	447.03	446.83	446.33	445.93	445.33
11......	444.63	444.63	446.43	446.43	447.63	447.53	447.33	447.03	446.83	446.33	445.83	445.33
12......	444.53	444.63	446.53	446.43	447.63	447.53	447.33	446.93	446.83	446.23	445.83	445.33
13......	444.43	444.63	446.53	446.53	447.63	447.63	447.33	447.03	446.83	446.23	445.83	445.33
14......	444.43	444.63	446.53	446.53	447.53	447.53	447.33	447.03	446.73	446.33	445.83	445.33
15......	444.53	444.63	446.43	446.43	447.53	447.53	447.23	447.03	446.73	446.23	445.83	445.33
16......	444.53	444.53	446.53	446.43	447.53	447.53	447.23	447.03	446.73	446.23	445.73	445.33
17......	444.43	444.53	446.43	446.53	447.53	447.43	447.23	446.93	446.73	446.23	446.03	445.33
18......	444.53	444.53	446.43	446.33	447.53	447.53	447.23	447.03	446.73	446.23	446.03	445.23
19......	444.43	444.63	446.53	446.43	447.43	447.43	447.23	446.93	446.63	446.23	446.03	445.13
20......	444.53	444.63	446.43	446.43	447.43	447.43	447.23	446.83	446.63	446.13	446.03	445.13
21......	444.43	444.53	446.53	446.43	447.43	447.43	447.23	446.83	446.63	446.13	446.03	445.13
22......	444.63	444.53	446.63	446.53	447.43	447.43	447.23	446.93	446.63	446.13	445.63	445.13
23......	444.93	444.73	446.63	446.43	447.53	447.43	447.23	446.83	446.63	446.13	445.63	445.13
24......	444.73	444.73	446.63	446.63	447.43	447.43	447.23	446.83	446.63	446.13	445.53	445.03
25......	444.73	444.73	446.63	447.03	447.63	447.43	447.13	446.83	446.63	446.13	445.63	445.03
26......	444.73	444.73	446.53	447.23	447.53	447.53	447.13	446.83	446.63	446.13	445.53	445.03
27......	444.73	444.83	446.53	447.23	447.63	447.43	447.13	446.83	446.63	446.13	445.53	445.03
28......	444.73	444.73	446.63	447.33	447.63	447.43	447.13	446.73	446.63	446.13	445.43	445.03
29......	444.53	......	446.63	447.33	447.63	447.33	447.13	446.73	446.53	446.13	445.43	445.03
30......	444.73	......	446.53	447.43	447.63	447.43	447.13	446.63	446.53	446.03	445.53	445.03
31......	444.63	......	446.63	......	447.63	......	447.13	446.63	......	446.03	......	445.03

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River above Guard-lock, near Geneva, N. Y.

DAY.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.*					
1..	......	446.48	446.18	445.48	445.03
2..	......	446.38	446.08	445.48	445.03
3..	......	446.48	446.08	445.48	445.03
4..	......	446.48	446.08	445.48	445.03
5..	446.83	446.48	446.08	445.38	445.13
6..	446.78	446.38	446.08	445.38	445.13
7..	446.78	446.38	446.08	445.48	445.03
8..	446.83	446.38	445.98	445.48	445.13
9..	446.83	446.33	445.98	445.38	445.03
10..	446.73	446.38	445.98	445.38	445.03
11..	446.63	446.38	445.98	445.48	444.93
12..	446.73	446.33	445.98	445.48	444.93
13..	446.68	446.38	445.98	445.38	445.03
14..	446.73	446.38	446.08	445.38	445.03
15..	446.83	446.38	445.88	445.38	445.03
16..	446.83	446.28	445.88	445.28	444.93
17..	446.68	446.28	445.88	445.28	444.93
18..	446.68	446.28	445.78	445.28	444.93
19..	446.68	446.28	445.78	445.28	444.93
20..	446.68	446.36	445.78	445.28	444.93
21..	446.58	446.28	445.78	445.28	444.93
22..	446.78	446.28	445.78	445.28	444.83
23..	446.58	446.28	445.68	445.18	444.83
24..	446.68	446.18	445.68	445.18	444.83
25..	446.68	446.28	445.68	445.08	444.83
26..	446.58	446.18	445.68	445.08	444.83
27..	446.58	446.18	445.68	445.08	444.83
28..	446.58	446.18	445.68	445.28	444.73
29..	446.58	446.18	445.58	445.28	444.73
30..	446.48	446.18	445.48	445.03	444.73
31..	446.58	......	445.48	......	444.73

* This table supersedes that on page 422 of 1909 report.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Seneca River above Guard-lock, near Geneva, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	444.73	444.53	444.93	446.53	447.43	447.63	447.33	447.13	446.73	446.63	446.03	445.53
2......	444.63	444.63	445.33	446.53	447.43	447.63	447.33	447.13	446.73	446.53	446.03	445.53
3......	444.63	445.63	445.43	446.53	447.63	447.63	447.33	447.03	446.73	446.53	445.93	445.53
4......	444.63	445.63	445.73	446.53	447.63	447.63	447.33	447.03	446.83	446.53	445.93	445.53
5......	444.63	445.63	445.83	446.53	447.63	447.53	447.23	447.03	446.73	446.43	445.93	445.43
6......	444.63	444.83	446.43	446.53	447.63	447.63	447.33	446.93	446.83	446.43	445.93	445.43
7......	444.63	444.83	446.43	446.53	447.63	447.63	447.33	446.93	446.83	446.43	445.93	445.43
8......	444.63	444.83	446.43	446.53	447.63	447.63	447.33	446.93	446.93	446.43	445.93	445.33
9......	444.63	444.53	446.43	446.53	447.63	447.53	447.33	447.03	446.83	446.43	445.93	445.33
10......	444.63	444.63	446.43	446.43	447.63	447.53	447.33	447.03	446.83	446.33	445.93	445.33
11......	444.63	444.63	446.43	446.43	447.63	447.53	447.33	447.03	446.83	446.33	445.83	445.33
12......	444.53	444.63	446.53	446.43	447.63	447.53	447.33	446.93	446.83	446.23	445.83	445.33
13......	444.43	444.63	446.53	446.53	447.63	447.63	447.33	447.03	446.83	446.23	445.83	445.33
14......	444.43	444.63	446.53	446.53	447.53	447.53	447.33	447.03	446.73	446.33	445.83	445.33
15......	444.53	444.63	446.43	446.43	447.53	447.53	447.23	447.03	446.73	446.23	445.83	445.33
16......	444.48	444.53	446.53	446.43	447.53	447.53	447.23	447.03	446.73	446.23	445.73	445.33
17......	444.43	444.53	446.43	446.53	447.53	447.43	447.23	446.93	446.73	446.23	445.63	445.33
18......	444.53	444.53	446.43	446.33	447.53	447.53	447.23	447.03	446.73	446.23	445.63	445.23
19......	444.43	444.63	446.53	446.43	447.43	447.43	447.23	446.93	446.63	446.23	445.63	445.13
20......	444.53	444.63	446.43	446.43	447.43	447.43	447.23	446.83	446.63	446.13	445.63	445.13
21......	444.43	444.53	446.53	446.43	447.43	447.43	447.23	446.83	446.63	446.13	445.63	445.13
22......	444.63	444.53	446.63	446.53	447.43	447.43	447.23	446.93	446.63	446.13	445.63	445.13
23......	444.83	444.68	446.63	446.43	447.53	447.43	447.23	446.83	446.63	446.13	445.63	445.13
24......	445.63	444.73	446.63	446.63	447.43	447.43	447.23	446.83	446.63	446.13	445.53	445.03
25......	445.63	444.73	446.63	447.03	447.63	447.43	447.13	446.83	446.63	446.13	445.63	445.03
26......	445.63	444.73	446.53	447.23	447.53	447.53	447.13	446.83	446.63	446.13	445.53	445.03
27......	445.63	444.83	446.53	447.23	447.63	447.43	447.13	446.83	446.63	446.13	445.53	445.03
28......	445.63	444.73	446.63	447.33	447.63	447.43	447.13	446.73	446.63	446.13	446.43	445.03
29......	444.53	......	446.63	447.33	447.63	447.33	447.13	446.73	446.53	446.13	446.43	445.03
30......	445.63	......	446.53	447.43	447.63	447.43	447.13	446.63	446.53	446.03	445.53	445.03
31......	444.63	......	446.63	......	447.63	......	447.13	446.63	......	446.03	......	445.03

SENECA LAKE AT GENEVA, N. Y.

Tables are included showing the elevation of water-surface of Seneca lake at the Geneva city pumping station, located about 2 miles south of Geneva on the west shore of the lake. These records are not referred to Barge canal datum, but are referred to the U. S. Geological Survey datum. A table is also presented showing the elevation of water-surface of Seneca lake at Geneva at various times. The data for this table was contributed by Mr. Charles T. Church, Superintendent of the Department of Public Works of Geneva.

The gage used at Geneva pumping station consists of two galvanized steel sections subdivided to feet and tenths. It is secured to a vertical post in the intake well of the pumping station. The elevation of the zero mark is 440.78, U. S. Geological Survey datum. The water elevation in the pump well is the same as in the lake. Readings are taken once each week.

Mean Daily Water-surface Elevations (U. S. G. S. Datum) of Seneca Lake at Geneva Pumping Station.

DAY.	Oct.	Nov.	Dec.
1905.			
1			
2			
3			
4			
5			
6			445.28
7			
8		445.38	
9			
10			
11			
12			
13			445.18
14			
15		445.78	
16			
17			
18			
19			
20			
21			445.28
22		445.08	
23			
24			
25	445.78		
26			
27			
28			
29		445.08	
30			445.48
31	445.58		

Mean Daily Water-surface Elevations (U. S. G. S. Datum) of Seneca Lake at Geneva Pumping Station.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1906.												
1								446.08				
2	445.48				445.88							
3										445.58		
4				445.48			446.18					
5									446.18			445.08
6						445.98						
7		445.28	445.18								445.18	
8												
9					445.88							
10	445.58									445.58		
11				445.68			446.28					
12												445.18
13						445.98			445.98			
14		445.18	445.18								445.18	
15												
16					445.88							
17	445.38									445.48		
18				445.88			446.18					
19									445.78			445.28
20						446.08						
21		445.18	444.68									
22											445.38	
23					445.88							
24	445.48									445.58		
25				446.08								
26							446.18		445.68			445.28
27						446.08						
28		445.08	445.08								445.28	
29								446.28				
30					445.98					445.28		
31	445.48											

Mean Daily Water-surface Elevations (U. S. G. S. Datum) of Seneca Lake at Geneva Pumping Station.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1												
2												
3												
4					446.38							
5										445.38		
6				445.78			446.08					
7									445.18			444.48
8						446.18						
9		445.78	445.18								444.58	
10								445.68				
11					446.48							
12	445.88									444.88		
13				445.68			446.08					
14									445.18			444.48
15						445.98						
16		445.58	445.28								444.68	
17								445.48				
18					446.48							
19	445.88									444.68		
20				445.68			445.88					
21									444.78			444.58
22						445.98						
23		445.38	445.08								444.68	
24								445.38				
25					446.38							
26	445.88									444.58		
27				445.98			445.78					
28		445.08							444.78			444.88
29			445.68			446.08						
30	445.78										444.48	
31					446.28		445.78	445.18		444.48		

Mean Daily Water-surface Elevations (U. S. G. S. Datum) of Seneca Lake at Geneva Pumping Station.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
1												
2												
3												
4	445.28			446.68			446.48					
5									446.18			444.58
6						446.58						
7			445.68								445.28	
8		445.08						446.48				
9					446.78							
10										445.58		
11	445.18			446.78			446.48					
12									446.08			444.48
13						446.68						
14			445.88								444.98	
15		444.98						446.38				
16					447.08							
17										445.48		
18	446.28			446.48			446.58					
19									445.78			444.38
20						446.68						
21			446.68								444.78	
22		445.48						446.28				
23					447.08							
24										445.18		
25	445.18			446.68			446.58					
26									445.58			444.18
27						446.48						
28			446.58								444.78	
29		445.58						446.18				
30				446.48	446.78				445.68			
31	445.18						446.58			445.28		444.18

Mean Daily Water-surface Elevations (U. S. G. S. Datum) of Seneca Lake at Geneva Pumping Station.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1												
2												
3												
4									445.68			444.18
5						446.48						
6		444.08	444.98								444.78	
7								445.98				
8					446.78							
9	444.08									445.28		
10				445.78			446.28					
11									445.58			444.18
12						446.28						
13		444.08	445.08								444.68	
14												
15					446.78							
16	444.08									445.28		
17				445.98			446.18					
18									445.68			444.18
19						446.38						
20		444.18	445.28								443.98	
21								445.78				
22					446.78							
23	443.98									445.18		
24				446.38			446.08					
25												443.88
26						446.38						
27		444.78	445.18								444.28	
28								445.78				
29					446.58							
30	444.08					446.28			445.38	444.88		
31			445.48	446.18			445.98					443.88

Mean Daily Elevation of Water-surface (U. S. G. S. Datum) of Seneca Lake at Geneva Pumping Station.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1												
2												
3												
4						446.88						
5			444.58								445.18	
6								446.38				
7					446.78							
8	443.78											
9				445.68			446.48					
10									446.18			444.68
11						446.78						
12		443.68	445.48								445.08	
13								446.18				
14					446.88							
15	443.68									445.58		
16				445.58			446.58					
17												
18						446.78						
19		443.68	445.78								444.78	
20								446.08				
21					446.68							
22	443.68									445.38		
23				445.68			446.38					
24									445.88			444.48
25						446.68						
26		443.78	445.68								444.68	
27								446.08				
28					446.78							
29	443.88									445.28		
30				446.48		446.58	446.38		445.88		447.78	
31			445.68					445.98				444.28

Data of Elevation of Seneca Lake at Steamboat Landing, Geneva, N. Y.

DATE.	Geneva datum (L. V. R. R.)	U. S. G. S. datum.	Taken by
April 11, 1900	437.28	428.65	Chas. T. Church.
Dec. 20, 1900	*434.60	425.97	Chas. T. Church.
April 24, 1901	†438.96	430.33	Chas. T. Church.
Mar. 6, 1902	437.94	429.31	Chas. T. Church.
Mar. 23, 1903	438.04	429.41	P. H. Brennan.
April 6, 1903	438.96	430.33	P. H. Brennan.
April 9, 1903	438.91	430.28	P. H. Brennan.
May 14, 1903	438.00	429.37	P. H. Brennan.
Sept. 25, 1903	437.78	429.15	P. H. Brennan.
Nov. 17, 1903	437.62	428.99	P. H. Brennan.
Jan. 15, 1904	436.50	427.87	P. H. Brennan.
Feb. 8, 1904	437.50	428.87	P. H. Brennan.
Mar. 8, 1904	438.08	429.45	P. H. Brennan.
Mar. 29, 1904	438.64	430.01	P. H. Brennan.
April 21, 1904	438.64	430.01	P. H. Brennan.
April 29, 1904	438.81	430.18	P. H. Brennan.
May 14, 1904	438.47	429.84	P. H. Brennan.
Nov. 3, 1904	436.59	427.96	P. H. Brennan.
Nov. 9, 1904	436.42	427.79	P. H. Brennan.
Dec. 6, 1904	435.77	427.14	P. H. Brennan.
Dec. 13, 1904	435.72	427.09	P. H. Brennan.
Feb. 8, 1905	435.40	426.77	P. H. Brennan.
Mar. 15, 1905	435.07	426.44	P. H. Brennan.
April 24, 1905	437.32	428.69	P. H. Brennan.
June 21, 1905	438.37	429.74	P. H. Brennan.
Sept. 13, 1905	436.31	427.68	P. H. Brennan.
Feb. —, 1909	435.14	426.51	P. H. Brennan.
July —, 1909	437.41	428.78	P. H. Brennan.
Dec. —, 1909	435.02	426.39	P. H. Brennan.

* Lowest. † Highest.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Clyde River at Clyde, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	381.21	381.55	384.75	382.25	386.70	384.65	384.11	384.30	384.90	384.55	384.80	385.00
2	381.23	381.20	385.70	382.20	386.79	384.60	384.00	384.29	384.90	384.55	384.80	384.92
3	381.25	381.50	387.10	381.95	386.00	384.50	384.00	384.21	385.00	384.55	384.60	384.92
4	381.30	381.50	389.15	381.90	386.32	384.45	383.90	384.30	385.10	384.55	384.60	385.02
5	381.30	381.50	390.20	381.88	386.63	384.50	383.80	384.30	385.20	384.40	384.50	385.05
6	381.30	381.40	389.85	381.80	386.70	384.60	384.00	384.35	385.80	384.30	384.50	384.90
7	381.25	381.40	389.00	381.70	386.30	385.00	383.90	384.35	385.40	384.30	384.50	384.90
8	381.25	381.30	388.85	381.70	385.90	385.00	383.80	384.35	385.30	384.30	384.50	384.80
9	381.27	381.20	388.10	381.75	385.62	384.85	383.70	384.40	385.20	384.40	384.60	384.70
10	381.25	381.30	387.25	381.75	385.50	384.90	383.70	384.40	385.00	384.40	384.60	384.60
11	381.30	381.40	386.20	381.65	385.30	384.95	383.80	384.40	385.00	384.60	384.60	384.60
12	381.30	381.40	385.60	381.80	385.20	384.90	383.90	384.40	385.00	384.50	384.50	384.60
13	381.27	381.40	385.10	381.90	385.10	384.99	384.10	384.40	385.90	384.50	384.50	384.70
14	381.26	381.40	384.90	381.95	385.05	384.85	384.00	384.30	385.85	384.49	384.60	384.70
15	381.27	381.40	384.70	382.20	384.90	384.80	383.92	384.20	385.80	384.48	384.73	384.70
16	381.20	381.40	384.40	382.60	384.85	384.70	384.00	384.05	384.75	384.47	384.74	384.70
17	381.12	381.50	383.95	383.10	384.55	384.65	384.00	384.00	384.69	384.45	384.75	384.60
18	381.30	381.50	383.76	383.90	384.50	384.65	384.00	384.30	384.65	384.60	384.75	384.60
19	381.40	381.60	383.70	384.10	384.60	384.60	383.90	384.60	384.65	384.60	384.80	384.60
20	381.50	381.70	383.50	384.55	384.70	384.55	383.70	384.60	384.60	384.60	384.80	384.60
21	381.55	381.80	383.60	384.50	384.85	384.50	383.50	384.60	384.65	384.60	384.80	384.60
22	381.92	381.70	383.70	384.34	384.80	384.40	383.50	384.70	384.65	384.60	384.90	384.60
23	382.90	381.70	383.45	384.15	384.70	384.39	383.90	384.95	384.62	384.60	384.90	384.60
24	383.00	381.60	383.35	384.95	384.65	384.25	384.00	384.49	384.60	384.63	384.90	384.60
25	382.60	381.50	383.20	386.20	384.80	384.20	384.40	384.50	384.59	384.62	384.90	384.70
26	382.35	381.50	382.90	386.70	384.70	384.20	384.60	382.90	384.59	384.65	384.90	384.70
27	382.06	381.60	382.55	386.70	384.56	384.23	384.60	382.90	384.60	384.60	384.90	384.70
28	381.87	382.20	382.47	386.60	384.70	384.30	384.50	382.70	384.60	384.60	384.90	384.70
29	381.70	......	382.45	386.50	384.70	384.20	384.50	383.90	384.60	384.80	384.90	384.80
30	381.65	......	382.40	386.50	384.70	384.10	384.50	384.00	384.55	384.75	384.90	384.80
31	381.60	......	382.35	......	384.75	......	384.50	384.90	......	384.70	......	384.90

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Clyde River at Geneva St., Lyons, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	390.60	391.70	397.10	392.30	394.60	392.60	391.60	391.60	392.50	391.50	391.60	392.00
2.....	390.50	391.60	399.60	392.30	394.60	392.60	391.60	391.70	392.10	391.40	391.50	392.10
3......	390.70	391.70	399.95	392.20	395.40	392.30	391.60	391.90	392.50	391.30	391.40	392.10
4.....	391.00	391.80	400.40	392.00	397.10	392.40	391.60	391.70	392.40	391.50	391.40	392.00
5.....	390.70	391.90	400.80	392.20	396.80	392.50	391.60	391.60	392.70	391.30	391.40	391.90
6.....	390.90	392.00	400.20	392.00	395.40	393.00	391.50	391.50	393.20	391.50	391.50	391.90
7.....	391.10	392.10	400.30	392.00	394.50	393.20	391.60	391.50	393.70	391.70	391.50	391.90
8.....	390.80	391.60	399.55	392.00	394.00	393.00	391.70	391.50	392.60	391.80	391.50	391.90
9.....	390.90	391.50	398.50	392.00	393.80	392.70	391.70	391.80	392.70	391.70	391.50	392.00
10......	390.90	391.40	396.60	392.00	393.80	392.50	391.60	392.10	392.30	391.60	391.60	391.80
11.....	391.30	391.20	395.55	392.00	393.60	392.40	391.80	392.00	392.10	391.60	391.80	391.50
12.....	391.20	391.20	394.95	392.00	393.40	392.40	391.70	391.90	391.90	391.60	391.80	391.30
13.....	391.10	391.30	394.50	391.90	393.10	392.40	392.30	391.60	392.00	391.60	391.70	391.50
14.....	391.30	391.30	394.20	391.90	393.00	392.40	392.00	391.60	392.00	391.60	391.60	391.62
15.....	391.00	391.60	393.50	391.80	392.90	392.20	391.60	391.60	392.10	391.30	391.60	391.70
16.....	390.70	391.50	393.70	391.80	392.80	392.10	391.80	391.60	392.10	391.30	391.70	391.90
17.....	390.80	391.90	393.60	391.80	392.70	392.00	391.80	391.40	392.00	391.30	392.00	392.00
18.....	390.90	392.00	393.10	391.90	392.70	392.00	391.80	391.90	391.90	391.40	392.00	391.90
19.....	391.30	392.00	393.10	392.00	392.70	392.00	392.00	391.80	391.80	391.40	392.10	391.80
20.....	391.50	392.10	393.30	392.10	392.70	392.00	392.00	391.70	391.80	391.50	392.10	391.68
21.....	391.60	392.10	393.70	392.40	392.70	391.90	391.80	391.90	391.60	391.50	392.00	391.55
22.....	392.90	392.00	393.60	392.20	392.60	391.90	391.80	392.40	391.50	391.40	391.70	391.50
23.....	394.00	392.00	393.30	392.20	392.40	391.90	391.50	392.40	391.50	391.30	391.50	391.30
24.....	393.30	391.70	393.10	394.00	392.50	391.90	391.50	391.70	391.50	391.20	391.30	391.35
25.....	392.80	391.90	392.90	397.20	393.00	391.90	391.70	391.60	391.60	391.50	391.60	391.40
26.....	392.60	391.90	392.80	397.80	393.00	391.90	392.00	392.00	391.90	391.60	391.50	391.50
27.....	392.30	392.20	392.70	397.40	392.60	391.90	392.20	391.60	391.80	391.60	391.50	391.55
28.....	392.20	393.40	392.60	395.80	392.60	391.80	392.00	391.80	391.60	391.40	391.60	391.65
29.....	392.20	......	392.50	394.80	392.60	391.70	392.20	392.10	391.60	391.40	391.70	391.50
30.....	391.70	......	392.40	394.70	392.60	391.70	392.00	391.80	391.60	391.60	391.90	391.95
31.....	391.80	......	392.40	......	392.60	......	391.80	392.00	......	392.00	......	392.12

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Ganargua Creek, North of Newark, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	407.20	408.40	411.73	408.40	408.20	408.10	407.50	407.90	407.80	408.50	408.20	408.00
2.....	407.30	408.40	414.30	408.30	408.10	408.00	407.50	408.10	407.80	408.50	408.30	408.00
3.....	407.30	408.30	414.75	408.40	408.20	408.00	407.60	407.90	407.90	408.40	408.30	407.90
4.....	407.20	408.20	414.95	408.50	408.60	407.90	407.50	407.70	408.10	408.40	408.40	408.00
5.....	407.20	408.20	414.60	408.40	408.90	407.90	407.60	407.70	408.20	408.30	408.50	408.00
6.....	407.20	408.10	414.40	408.30	408.70	408.00	407.50	407.80	408.00	408.50	408.60	408.10
7.....	407.20	408.20	413.90	408.30	408.40	407.90	407.50	407.70	408.20	408.60	408.60	408.20
8......	407.10	408.20	413.10	408.30	408.40	408.00	407.50	407.60	408.50	408.60	408.50	408.40
9.....	407.10	408.20	412.30	408.20	408.30	407.80	407.40	407.60	408.60	408.50	408.50	408.30
10.....	407.10	408.30	411.40	408.10	408.20	408.00	407.50	407.50	408.70	408.50	408.60	408.10
11.....	407.20	408.30	410.90	408.10	408.10	408.10	407.50	407.50	408.60	408.50	408.60	408.20
12.....	407.30	408.20	410.60	408.00	408.20	408.20	407.50	407.40	408.70	408.40	408.60	408.10
13.....	407.20	408.20	410.70	408.00	408.20	408.10	407.40	407.40	408.70	408.40	408.70	407.90
14.....	407.20	408.30	410.80	407.90	408.10	408.10	408.30	407.60	408.60	408.30	408.80	408.00
15.....	407.20	408.30	410.70	407.90	408.10	408.00	408.40	407.50	408.60	408.20	408.80	408.10
16.....	407.20	408.20	410.70	407.80	408.20	408.00	408.10	407.50	408.50	408.30	408.90	408.20
17.....	407.30	408.10	410.50	408.00	408.20	408.20	407.90	407.40	408.50	408.20	408.80	408.10
18.....	407.40	408.10	410.40	408.10	408.10	408.10	408.30	407.40	408.60	408.10	408.90	408.00
19.....	407.40	408.10	410.10	408.30	408.10	408.10	408.10	407.50	408.70	408.00	408.90	407.90
20.....	407.30	408.20	410.20	408.30	407.90	408.00	408.00	407.60	408.70	408.00	409.00	407.80
21.....	407.30	408.20	410.00	408.20	407.90	408.10	407.90	407.60	408.60	408.00	409.00	407.90
22.....	407.30	408.10	410.00	408.20	407.80	408.00	407.80	407.50	408.60	408.10	409.10	407.90
23.....	407.20	408.10	409.70	408.20	408.30	407.80	407.70	407.70	408.50	408.10	409.10	407.80
24.....	407.30	408.10	409.80	408.60	408.20	407.80	407.70	407.60	408.60	408.00	409.00	407.80
25.....	407.50	408.10	409.50	409.80	408.30	407.70	407.70	407.50	408.70	408.00	409.00	407.90
26.....	407.60	408.10	409.40	410.10	408.30	407.60	407.60	407.50	408.80	408.10	409.20	407.90
27.....	407.90	408.20	409.20	409.70	408.20	407.70	407.60	407.50	408.80	408.20	409.00	407.90
28.....	408.00	408.40	408.90	409.40	408.20	407.70	407.80	407.60	408.70	408.20	408.80	407.80
29.....	408.20	......	408.50	409.30	408.10	407.60	407.70	407.50	408.60	408.30	408.50	407.80
30......	408.50	......	408.40	409.50	408.20	407.60	407.60	407.50	408.50	408.20	408.30	407.80
31.....	408.50	......	408.40	......	408.10	......	407.80	407.70	......	408.20	......	407.80

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Ganargua Creek near Palmyra, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	421.53	422.33	425.48	421.98	422.53	422.28	421.73	421.73	422.13	421.93	422.18	422.23
2.....	421.63	422.23	425.43	421.93	422.93	422.23	421.73	421.63	422.23	421.73	422.13	422.33
3.....	421.68	422.13	425.58	421.93	423.18	422.23	421.78	421.93	422.23	421.93	422.08	422.33
4.....	421.83	422.13	425.38	421.98	424.08	422.18	421.83	421.93	422.18	422.03	422.18	422.38
5.....	422.23	422.18	424.88	421.93	423.43	422.23	421.78	421.93	422.13	422.03	422.08	422.38
6.....	421.83	422.13	424.53	421.98	422.93	422.43	421.83	421.73	422.93	422.13	422.08	422.33
7.....	421.73	422.23	425.43	421.93	422.73	422.53	421.93	421.68	422.83	422.23	422.13	422.33
8.....	421.58	422.23	424.13	421.93	422.53	422.53	421.83	422.03	422.78	422.13	422.13	422.18
9.....	421.63	422.13	423.58	421.93	422.43	422.33	421.93	421.93	422.23	422.03	422.18	422.13
10.....	421.63	422.18	423.08	421.88	422.53	422.28	421.88	421.83	422.13	421.98	422.23	422.08
11.....	421.58	422.18	422.93	421.93	422.53	422.28	421.83	421.78	422.03	421.93	422.18	422.08
12.....	421.73	422.23	422.88	421.98	422.43	422.38	421.93	421.83	422.03	421.98	422.23	422.03
13.....	421.88	422.18	422.83	421.83	422.33	422.23	422.08	421.73	421.98	422.03	422.23	422.03
14.....	421.73	422.23	422.83	421.83	422.28	422.23	422.03	421.73	421.93	422.03	422.28	422.03
15.....	421.73	422.23	422.53	421.88	422.23	422.18	421.88	421.78	422.03	421.93	422.28	421.93
16.....	421.68	422.23	422.53	421.93	422.23	422.03	421.83	421.83	421.93	421.83	422.38	422.03
17.....	421.63	422.18	422.43	421.93	422.23	422.03	421.98	421.88	422.03	421.93	422.43	422.13
18.....	422.33	422.23	422.43	421.98	422.23	421.98	421.98	421.93	421.93	421.98	422.48	422.03
19.....	422.28	422.28	422.48	421.93	422.23	421.88	421.88	421.93	421.93	422.03	422.48	422.03
20.....	422.28	422.33	422.48	422.13	422.28	421.83	421.83	421.88	421.88	422.08	422.63	422.08
21.....	422.33	422.43	422.78	422.03	422.18	421.83	421.83	421.88	421.88	422.08	422.33	422.08
22.....	422.88	422.43	422.58	422.43	422.13	421.88	421.88	421.83	421.93	422.13	422.23	422.03
23.....	423.13	422.38	422.48	422.43	422.08	421.83	421.93	421.88	422.08	422.03	422.18	421.93
24.....	423.18	422.43	422.43	422.73	422.08	421.83	421.88	421.13	421.98	422.08	422.13	421.93
25.....	422.88	422.43	422.43	424.33	422.43	421.78	421.93	421.93	421.98	422.03	422.13	421.93
26.....	422.53	422.38	422.33	424.23	422.43	421.88	422.03	422.03	421.93	422.13	422.13	422.03
27.....	422.53	422.53	422.28	423.03	422.53	421.73	421.93	421.83	421.88	422.18	422.08	422.13
28.....	422.43	422.48	422.28	422.83	422.33	421.93	421.88	421.88	421.88	422.13	422.13	422.18
29.....	422.33	......	422.23	422.63	422.23	421.88	421.83	421.93	421.93	422.03	422.18	422.18
30.....	422.33	......	422.18	422.53	422.28	421.83	421.88	421.98	421.93	422.13	422.23	422.13
31.....	422.33	......	422.18	......	422.38	......	421.88	422.03	......	422.18	......	422.13

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Canandaigua Outlet at Alloway, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	404.02	404.32	409.12	405.12	406.72	404.92	404.42	403.72	403.92	403.72	404.12	404.02
2.....	403.92	404.32	409.72	405.02	406.72	404.92	404.22	403.72	403.92	403.72	404.12	404.12
3.....	403.92	404.32	410.42	404.92	407.22	404.92	404.12	403.52	403.92	403.72	404.02	404.12
4.....	403.92	404.52	410.52	404.92	408.02	404.92	404.32	403.52	404.02	403.82	403.92	404.12
5.....	404.02	404.52	410.42	404.92	407.42	404.92	404.52	403.62	404.12	403.92	403.92	404.22
6.....	404.12	404.52	409.52	404.92	407.02	405.12	404.62	403.72	404.42	403.92	403.92	404.32
7.....	404.12	404.62	409.82	404.82	406.52	405.32	404.32	403.72	404.52	403.92	403.82	404.32
8.....	404.12	404.62	409.02	404.72	406.42	405.22	404.12	403.72	404.52	403.92	403.72	404.32
9.....	404.02	404.52	407.92	404.72	406.32	405.12	403.92	403.72	404.52	403.82	403.72	404.32
10.....	404.02	404.52	407.22	404.72	406.22	405.12	403.82	403.82	404.22	403.72	403.72	404.12
11.....	404.12	404.32	406.72	404.72	406.12	405.12	403.72	403.92	404.12	403.72	403.92	404.12
12.....	404.12	404.32	406.32	404.72	406.12	405.12	403.72	403.82	404.02	403.72	403.92	404.12
13.....	404.12	404.32	406.22	404.72	406.02	404.92	404.22	403.72	403.92	403.72	403.92	404.12
14.....	404.02	404.32	406.02	404.72	405.92	404.92	404.22	403.72	404.02	403.92	404.02	404.22
15.....	403.92	404.42	405.92	404.52	405.72	404.92	404.12	403.72	404.12	403.92	404.12	404.52
16.....	403.92	404.52	405.92	404.52	405.62	404.82	403.82	403.72	404.12	403.92	404.12	404.42
17.....	403.92	404.42	405.72	404.52	405.52	404.72	403.72	403.72	404.12	403.92	404.02	404.32
18.....	403.92	404.32	405.32	404.62	405.42	404.72	403.72	403.82	404.12	403.92	403.92	404.32
19.....	403.92	404.32	405.32	404.72	405.32	404.72	403.72	403.92	404.02	403.92	403.92	404.32
20.....	404.12	404.52	405.32	404.72	405.32	404.72	403.72	403.92	403.92	403.92	403.92	404.52
21.....	404.12	404.52	405.32	404.72	405.32	404.72	403.92	403.92	403.92	403.92	403.92	404.42
22.....	405.62	404.52	405.52	404.82	405.32	404.72	403.92	403.92	403.92	403.92	403.92	404.32
23.....	405.42	404.72	405.42	405.02	405.32	404.72	403.92	403.82	403.92	403.92	403.92	404.12
24.....	405.32	404.72	405.32	405.82	405.52	404.72	403.92	403.72	403.92	403.92	403.92	404.12
25.....	405.02	404.72	405.32	408.82	405.52	404.72	403.92	403.72	403.92	403.92	403.92	404.12
26.....	404.42	404.72	405.22	408.12	405.32	404.72	403.82	403.72	403.82	403.92	403.92	404.32
27.....	404.32	404.72	405.12	407.82	405.32	404.72	403.72	403.72	403.72	403.92	403.72	404.52
28.....	404.22	406.12	405.12	407.32	405.32	404.72	403.72	403.72	403.72	403.92	403.82	404.42
29.....	404.32	......	405.12	407.22	405.12	404.72	403.72	403.82	403.72	403.92	403.92	404.32
30.....	404.32	......	405.12	407.12	405.12	404.72	403.72	403.92	403.72	403.92	403.92	404.52
31.....	404.22	......	405.12	......	405.02	......	403.72	403.92	......	404.12	......	404.52

ONONDAGA CREEK.

DESCRIPTION.

Onondaga lake receives the drainage from two principal tributaries, Onondaga creek and Otisco lake outlet, or Nine Mile creek. The lake is drained by a short outlet about one mile in length, entering Seneca river at Mud Lock. The outlet was formerly improved by the State for the purpose of draining lands adjoining the lake and reducing the flood level. The fall from the foot of the lake to Seneca river is very slight. The stage is affected by a growth of aquatic plants so that the discharge from the outlet is apparently not a direct function of the stage. The stage of the lake is also affected by the stage of Seneca river. It is stated that floods in Onondaga lake usually recede before the maximum stage of Seneca river, so that at times the current in the outlet is reversed and water flows from the river into the lake. A detailed description of the drainage basin, with results of current-meter measurements made in the outlet, may be found in the report of the State Engineer and Surveyor for 1904, pages 494–501.

ONONDAGA CREEK AT TEMPLE ST., SYRACUSE, N. Y.

A gaging station was established on Onondaga creek at Temple street bridge, Syracuse, by Guy Moulton, for this Department, January 16, 1908. The elevation of water-surface when the gage reads zero is 376.11. Observations are taken each morning and night by L. Moulton. Current-meter measurements have been made from the bridge by the Syracuse Intercepting Sewer Commission.

The results are furnished for publication by courtesy of Mr. Glenn D. Holmes, Chief Engineer of the Commission.

Current-meter Discharge Measurements of Onondaga Creek at Temple St., Syracuse, N. Y.

DATE.	Hydrographer.	Mean gage reading.	Completed discharge.
			Second-feet.
1909.			
Feb. 6....	....	18.24	479
Feb. 25....	....	20.40	1,063
April 15....	....	19.17	724
Dec. 4....	Vernon and Weiskotten..........	15.32	30
1910.			
Mar. 1....	Vernon and Weiskotten..........	22.75	1,496
Mar. 1....	Vernon and Weiskotten..........	22.31	1,443
Mar. 2....	Vernon and Lyon..........	21.87	1,320
Mar. 2....	Wood and Weiskotten..........	22.07	1,364
Mar. 2....	Wood and Weiskotten..........	21.77	1,238
Mar. 2....	Wood and Weiskotten..........	21.07	963
Mar. 3....	Vernon and Harwood..........	20.20	814
Mar. 3....	Wood and Harwood..........	19.61	694
Mar. 3....	Wood and Harwood..........	19.47	647
Mar. 4....	Weiskotten and Foelker..........	19.33	675
Mar. 4....	Weiskotten and Jones..........	18.92	537
Mar. 9....	Wood and Foelker..........	18.25	412
Mar. 9....	Wood and Foelker..........	18.05	351
Mar. 10....	Wood and Foelker..........	17.60	273
Mar. 12....	Wood and Foelker..........	17.26	263
Mar. 18....	Wood and Foelker..........	16.61	178

NOTE.— During the period covered by these gagings there was a dam in the creek at Water street, obstructing the east and middle arches of the culvert under the Erie canal.

Mean Daily Discharge, Second-feet, of Onondaga Creek at Temple St., Syracuse, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1.....	68	79	254	......	341	120	51	42	54	50	45	40
2.....	32	85	253	300	391	160	52	41	51	45	44	40
3.....	52	90	244	355	......	150	57	42	48	50	45	42
4.....	46	77	252	349	228	120	68	44	50	46	48	43
5.....	80	100	173	311	221	160	65	43	47	51	48	42
6.....	165	490	136	302	167	138	61	42	46	45	44	40
7.....	131	387	215	309	410	110	50	43	44	49	44	39
8.....	53	208	202	399	306	120	61	45	46	46	52	39
9.....	70	185	186	282	249	131	64	44	45	45	46	40
10.....	75	154	345	294	275	150	61	50	47	43	45	40
11.....	81	185	966	181	371	142	64	45	46	40	44	40
12.....	97	125	436	297	268	106	60	46	48	50	43	38
13.....	85	142	399	219	251	117	57	45	53	45	44	36
14.....	78	160	300	384	235	136	54	44	50	47	44	47
15.....	77	......	276	825	273	126	51	42	47	47	48	43
16.....	60	151	237	474	306	221	54	72	56	45	45	41
17.....	60	143	226	352	297	120	57	59	50	46	50	39
18.....	58	129	203	338	209	89	60	68	45	43	48	38
19.....	77	122	173	293	......	126	65	50	44	45	45	39
20.....	60	726	208	293	206	93	57	53	44	50	45	36
21.....	55	716	194	224	180	93	53	51	45	45	46	36
22.....	58	507	188	203	142	94	54	48	46	45	50	36
23.....	295	463	177	228	110	87	57	43	49	46	46	38
24.....	369	635	186	205	65	95	60	49	55	50	45	36
25.....	330	1,014	334	202	45	74	65	47	49	50	45	41
26.....	294	432	699	191	160	65	61	46	46	46	45	40
27.....	132	444	429	188	140	61	65	44	43	43	61	39
28.....	125	348	513	175	158	57	56	46	45	45	48	41
29.....	97	......	457	260	161	61	51	59	43	43	53	38
30.....	92	......	334	348	120	99	43	47	75	45	46	39
31.....	90	......	253	......	120	......	40	44	......	43	......	39
Mean.	111	307	305	313	221	114	58	48	48	46	47	40

Mean Daily Discharge, Second-feet, of Onondaga Creek at Temple St., Syracuse, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	39	86	1,737	165	78	79	43	59	55	51	59	......
2.....	41	74	1,279	158	88	89	55	42	48	49	65	......
3.....	39	99	816	150	122	122	58	39	56	57	70	......
4.....	37	86	598	127	143	143	55	36	43	56	60	......
5.....	39	78	566	131	114	113	56	36	45	71	75	......
6.....	41	66	555	116	110	110	45	42	77	90	80	......
7.....	41	71	945	124	105	105	41	39	197	70	84	......
8.....	40	78	730	122	74	75	40	36	180	51	86	......
9.....	43	92	470	119	80	80	40	36	156	54	100	......
10.....	45	95	326	123	88	88	41	40	123	49	110	......
11.....	42	91	296	131	86	87	42	42	102	47	202	......
12.....	47	84	302	139	84	84	43	37	94	42	187	......
13.....	45	88	255	134	80	81	65	40	78	89	155	......
14.....	43	84	322	142	80	78	55	39	76	46	132	......
15.....	42	86	255	142	74	95	43	36	57	75	105	......
16.....	41	80	242	134	68	88	41	40	48	53	90	......
17.....	43	85	197	151	66	90	42	48	45	84	79	......
18.....	86	95	200	147	84	85	40	45	52	74	80	......
19.....	112	87	199	140	70	75	43	70	41	47	123	......
20.....	110	116	289	123	56	74	42	39	53	55	110	......
21.....	120	91	330	100	82	65	45	44	92	66	112	......
22.....	175	87	253	122	112	60	66	36	72	75	117	......
23.....	392	88	240	92	173	56	48	56	45	92	115	......
24.....	272	103	235	88	186	58	42	66	47	77	107	......
25.....	145	96	253	110	250	54	26	69	43	80	91	......
26.....	74	100	210	99	262	70	46	67	56	58	98	......
27.....	140	140	180	99	135	56	45	50	48	99	108	......
28.....	110	1,354	177	94	120	49	44	53	50	96	116	......
29.....	94	......	173	78	110	50	40	37	46	94	151	......
30.....	81	......	176	68	121	49	32	45	49	54	180	......
31.....	110	......	168	......	101	......	47	47	......	56	......	......
Mean.	88	135	418	122	110	80	46	46	72	66	108	......

Monthly Discharge of Onondaga Creek at Temple St., Syracuse, N. Y.
[Drainage area, 108 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1909.					
January	....	....	111	1.03	1.19
February	....	....	307	2.84	2.96
March	....	....	305	2.82	3.25
April	....	....	313	2.90	3.24
May	....	....	221	2.05	2.36
June	....	....	114	1.06	1.18
July	....	....	58	0.55	0.61
August	....	....	48	0.44	0.51
September	....	....	49	0.45	0.50
October	....	....	46	0.43	0.50
November	....	....	47	0.43	0.48
December	....	....	40	0.37	0.43
1910.					
January	....	....	88	0.81	0.93
February	....	....	135	1.25	1.30
March	....	....	419	3.88	4.47
April	....	....	122	1.13	1.26
May	....	....	110	1.02	1.18
June	....	....	80	0.74	0.83
July	....	....	46	0.42	0.48
August	....	....	46	0.42	0.48
September	....	....	73	0.67	0.75
October	....	....	67	0.62	0.71
November	....	....	108	0.99	1.10
December	....	....	....	....	....

HARBOR BROOK DRAINAGE BASIN.

HARBOR BROOK AT LAKEVIEW AVENUE, SYRACUSE, N. Y.

A gaging station was established on Harbor brook by the Syracuse Intercepting Sewer Board on March 12, 1908. Harbor brook is a small stream draining an area of 10 square miles and lying westerly of Onondaga creek basin. Results of the gagings of this stream are shown in the appended tables. They have been furnished for publication by Mr. Glenn D. Holmes, Chief Engineer of the Board.

Mean Daily Discharge, Second-feet, of Harbor Brook at Lakeview Av., Syracuse, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1	12	12	11	14	......	......	......	15	21	......	......	......
2	11	12	10	13	15	......	......	13	20	......	......	......
3	10	11	10	13	......	......	......	13	20	18	......	......
4	11	11	11	14	......	......	......	12	18	......	......	......
5	12	13	11	20	......	......	......	......	17	......	......	15
6	12	14	10	15	......	15	......	......	21	......	......	......
7	10	12	17	14	......	......	......	......	20	......	20	......
8	11	11	15	14	......	18	......	15	18	......	18	......
9	12	11	11	13	......	16	......	......	16	......	12	......
10	12	12	12	13	14	17	......	......	......	19	13	......
11	13	13	12	14	32	15	......	......	......	......	......	......
12	12	12	12	......	......	15	......	......	......	......	......	15
13	12	11	11	......	......	18	......	......	......	......	......	......
14	12	12	13	......	......	18	......	......	......	......	15	......
15	12	12	20	......	......	17	......	14	......	......	......	......
16	11	11	15	......	......	22	......	21	......	......	......	......
17	11	11	14	......	18	21	......	21	......	21	......	......
18	11	11	13	14	......	20	......	22	......	......	......	......
19	11	12	13	......	......	18	......	......	15	......	......	14
20	12	14	14	......	......	16	......	......	......	......	......	......
21	12	13	14	......	......	16	17	18	......	......	18	......
22	12	13	20	......	21	......	15	17	......	......	......	......
23	13	12	15	......	20	......	15	......	15	......	......	......
24	14	13	14	......	18	......	19	......	......	22	......	......
25	11	......	15	15	......	......	20	......	......	......	......	......
26	11	12	20	......	......	......	21	......	18	......	......	15
27	11	12	14	......	22	16	23	......	......	......	......	20
28	11	12	13	......	19	......	20	......	......	......	21	......
29	10	......	20	......	16	......	19	18	......	......	......	......
30	11	......	15	......	14	......	18	......	......	......	......	......
31	12	......	13	......	16	......	16	......	......	20	......	......
Mean...	12	12	14	14	19	17	18	17	18	20	17	16

Mean Daily Discharge, Second-feet, of Harbor Brook at Lakeview Ave., Syracuse, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
1910.									
1					25				
2	18								
3				18			20		
4									
5						24			
6		15							
7								20	20
8					23				
9	19								
10				21			20		
11			28						
12									
13		17	23			21			
14								24	24
15					21				
16	18								
17				24			21		
18									23
19						21			*
20		19	26						
21								21	
22					22				
23	23								
24				26			20		
25									
26									
27		24	18						
28								21	
29									
30	18				26				
31							24		

* Gage destroyed.

SENECA RIVER.

SENECA RIVER AT BALDWINSVILLE, N. Y.

This station was established November 12, 1908, by Geo. W. Rafter, for the U. S. Deep Waterways Commission. It is maintained by U. S. Geological Survey in coöperation with this Department. The gaging station is located at the State dam in Baldwinsville, 12.5 miles along river from the junction of Seneca river with Oneida river. These two streams unite at Three River Point to form Oswego river.

The location of the gaging station is shown on the Baldwinsville sheet, United States Geological Survey topographic map.

Gage readings in the river channel below the dam are utilized to determine the average working head on turbines. Discharge through the three main canals is determined from records of the run of water-wheels, kept in each mill, and from the recorded lockage and opening of paddles at the Oswego canal lock at the foot of the canal.

Current-meter measurements, to determine the leakage of the several mills, have been made during 1910, as in preceding years.

During 1909 the masonry State dam on Seneca river at Baldwinsville was changed by the addition of a concrete crest of ogee form, also by the addition of a steel segmental sluice gate at the left-hand end of the dam. A new profile of the dam has been obtained and a discharge table prepared therefrom for the new conditions. The record for the year 1909 and part of 1910 is somewhat approximative, owing to the existence of a coffer-dam in the stream and other unfavorable conditions resulting from changes in progress.

Records for 1909 and 1910 are not available for publication.

SKANEATELES LAKE AND OUTLET.

Skaneateles lake outlet enters Seneca river above Cross lake, crossing the Erie canal at Jordan. The fall from the foot of the lake at this point is 465 feet.

The surface of the lake has an elevation of 865 feet above tide. The valley on each side of the lake has an average width of 2.5 miles, and in this distance there is a rise of 400 to 800 feet, the greater part of it being within a mile of the lake. The inflow to the lake is through numerous short lateral feeders flowing down these slopes. The drainage areas of the lake are shown below:

*Drainage areas of Skaneateles Lake.**

	Square miles.
Land surface above State dam at Skaneateles	60.25
Water surface of lake at Skaneateles	12.75
Total drainage area above foot of lake (water surface = 17.46 per cent)	73.00
Total area above Willow Glen weir	74.25
Area above Erie canal at Jordan	93.00

SKANEATELES OUTLET AT WILLOW GLEN, N. Y.

The station was established March 10, 1895. It is located in the village of Willow Glen, 1.5 miles below the foot of Skaneateles lake.

Observation is made of the daily discharge over a thin-edged weir, having a crest length of 27 feet, with two end contractions. The discharge is calculated from the observed depth on a stake

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[*] Areas here given have been taken from proceedings in condemnation of water-powers on Skaneateles outlet. The lake and its tributary area are shown on the Skaneateles, Tully, Cortland and Moravia topographic atlas sheets of the United States Geological Survey.

set with its top at crest level, 5.2 feet up-stream from the weir, by means of the Francis formula, including corrections for end contractions and velocity of approach.

Since July 1, 1894, the water-supply of the city of Syracuse has been drawn from Skaneateles lake, and the amount of this diversion should be added to the discharge over Willow Glen weir to obtain the total run-off of the drainage basin. The calculated diversion, as determined from the record of gate openings and head of the inlet gates, using the formula for orifices with a constant coëfficient stated as 0.62 has been furnished by the city of Syracuse. The observations at the weir and gates were taken by Edward Conron.

A complete description of earlier gagings of this stream is contained in the report of the State Engineer of New York, supplement for 1902, pages 61–76.

Records for 1909 and 1910 are not available for publication.

SENECA RIVER.

SENECA RIVER BELOW LOCK NO. 6 AT SENECA FALLS, N. Y.

The gage was established on Seneca river below Seneca Falls on November 16, 1909, by L. S. Hulburd for this Department. The gage consists of a 5-ft. enameled steel section, fastened to a pile near the right-hand, down-stream bank just above the State weir at Seneca Falls. The elevation of the zero mark of the gages is 391.41, Barge canal datum. The weir is utilized to calculate the discharge of the river at this point. The small quantity of water which is diverted around the dam by leakage through the flume of an abandoned water power has been measured and is included in the estimated flow. An estimate of the quantity of water used for canal purposes is also made from a record of the operation of the adjacent locks. The channel of approach above the weir is shallow and irregular and is obstructed by ice in the winter season. The crest of the dam is also somewhat irregular and flash-boards are usually maintained thereon. Owing to these conditions the estimate of discharge cannot be made as precise as is desired and the record is published as approximate only and is subject to revision.

Mean Daily Discharge, Second-feet, of Seneca River below Lock 6, Seneca Falls, N. Y.

DAY.	Nov.	Dec.
1909.		
1	......	101
2	......	101
3	......	106
4	......	122
5	......	48
6	......	112
7	......	96
8	......	101
9	......	112
10	......	101
11	......	85
12	......	48
13	......	85
14	......	117
15	......	112
16	171	122
17	177	112
18	112	85
19	133	40
20	80	91
21	48	56
22	91	24
23	80	29
24	91	34
25	68	20
26	80	20
27	56	40
28	48	34
29	101	24
30	112	29
31	......	34
Mean	97	72

Mean Daily Discharge, Second-feet, of Seneca River below Lock 6, Seneca Falls, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	20	52	64	112	*277	357	203	277	316	357	316	139
2	*20	52	20	112	357	357	240	277	277	*316	240	112
3	20	52	20	*44	400	277	*139	277	277	357	240	112
4	20	40	96	85	539	277	112	277	*277	357	240	*44
5	20	37	68	85	444	*277	203	277	316	357	277	85
6	20	*20	*20	85	357	357	277	240	357	357	*203	85
7	20	152	20	85	357	357	277	*171	357	357	277	85
8	20	85	20	85	*357	277	277	277	357	357	240	85
9	*20	44	20	85	357	277	240	277	277	*277	316	85
10	20	20	20	*85	357	277	*203	277	277	316	277	20
11	20	29	20	64	357	277	203	277	*203	357	240	*20
12	20	20	22	64	357	*277	240	277	277	357	240	20
13	20	*20	*52	64	357	277	171	277	277	277	*203	29
14	20	22	60	64	357	277	203	*203	316	316	277	29
15	20	20	48	64	*316	203	203	277	277	316	316	64
16	*20	22	64	85	357	203	240	277	277	*316	240	44
17	20	20	64	*64	357	203	*203	316	316	316	277	64
18	20	20	64	85	357	139	277	277	*277	316	277	*20
19	20	20	64	85	357	*112	240	240	277	316	277	29
20	20	*20	*72	112	357	171	277	240	316	357	*240	20
21	22	29	72	112	277	316	240	*203	277	357	203	20
22	20	29	96	112	*203	277	240	277	277	316	240	20
23	*20	24	96	112	357	203	357	277	277	*277	112	20
24	31	20	101	*85	357	240	*539	316	316	64	20	20
25	52	20	85	491	400	203	400	316	*277	20	85	*20
26	48	20	85	357	357	*203	240	357	316	29	64	20
27	52	*20	*a	357	357	203	277	277	316	29	*20	20
28	52	20	a	357	316	240	277	*240	357	316	85	20
29	68	......	85	316	*277	240	203	277	357	277	139	29
30	*20	......	139	357	357	203	240	277	316	*277	139	20
31	48	......	139	......	316	......	*240	316	......	316	......	20
Mean	26.9	33.9	61.9	142	352	253	361	272	300	288	211	45.8

a Gage destroyed, no record. * Sunday.

Monthly Discharge of Seneca River below Lock No. 6, Seneca Falls, N. Y.
[Drainage area, 780 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1909.					
November	177	48	97	0.124	0.139
December	122	20	72	0.092	0.106
1910.					
January	68	20	26.9	0.034	0.039
February	152	20	33.9	0.043	0.045
March	139	20	61.9	0.079	0.091
April	491	44	142	0.182	0.203
May	539	203	352	0.451	0.520
June	357	112	253	0.324	0.362
July	539	112	248	0.318	0.366
August	316	171	272	0.349	0.402
September	357	203	300	0.385	0.430
October	357	20	288	0.369	0.425
November	316	20	211	0.271	0.302
December	139	20	45.8	0.059	0.068

CLYDE RIVER.

DESCRIPTION.

Clyde river joins Seneca river in the Montezuma marsh near the foot of Cayuga lake. Clyde river is formed by the junction of Canandaigua outlet and Ganargua creek, at Lyons. Its total length is about 20 miles and the greater portion of its course lies through a broad, marshy valley. Ganargua creek proper rises near Victor. Its course is northeasterly to Macedon. It then flows easterly, winding broadly through the system of duplicate valleys extending easterly from Macedon. The principal tributary of Ganargua creek is Mud creek, which rises in the hilly region near the head of Canandaigua lake and flows northward about 20 miles, entering Ganargua creek at Victor. Ganargua creek is often called Mud creek throughout its course to Lyons. The valley through which it flows is, however, called Ganargua valley. The tributary drainage is of the characteristic glacial kame type and the tributaries are rather sparse, flowing oftentimes first north and then south between elongated hills, until they find their way to Ganargua creek.

CLYDE RIVER AT CLYDE, N. Y.

A gage was established at Sodus street bridge in the village of Clyde, October 20, 1905, by E. V. R. Payne, of this Department. A gage of the box-and-chain type is used. The scale is divided decimally from zero to 8 feet. The elevation of water-surface, when the gage reads zero, is 380.00. The gage is located on the down-stream side of the central span of the bridge. The bridge has a total length between abutments of 174 feet. It is subdivided into 5-foot sections on the down-stream side for current-meter measurements, the initial point being the face of the right-hand abutment. Readings are taken each day. It has been impossible to compute the discharge for 1910, owing to the changed channel conditions due to Barge canal construction.

Mean Daily Discharge, Second-feet, of Clyde River at Clyde, N. Y.

DAY.	Oct.	Nov.	Dec.
1905.			
1	......	289	311
2	......	296	319
3	......	296	319
4	......	289	336
5	......	289	336
6	......	296	336
7	......	319	336
8	......	311	336
9	......	311	354
10	......	311	365
11	......	304	365
12	......	296	375
13	......	296	354
14	......	296	336
15	......	296	304
16	......	296	354
17	......	296	304
18	......	296	296
19	......	296	296
20	319	296	296
21	311	296	304
22	304	289	560
23	304	282	633
24	296	282	471
25	289	282	450
26	289	282	431
27	289	282	345
28	289	282	326
29	282	296	365
30	289	304	773
31	296	......	......
Mean	296	295	376

Mean Daily Discharge, Second-feet, of Clyde River at Clyde, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1906.												
1......	471	345	400	2,755	345	387	1,140	345	345	365	375	375
2......	415	326	400	2,495	345	375	1,087	336	345	354	375	365
3......	490	375	375	1,935	450	365	875	345	345	345	375	345
4......	450	365	825	1,411	526	354	1,525	431	345	345	375	365
5......	633	345	1,087	1,195	471	354	1,873	450	345	345	375	387
6......	560	336	678	1,140	450	365	2,130	431	336	345	365	387
7......	400	326	450	1,140	431	365	2,200	387	336	365	365	1,087
8......	594	326	387	875	415	375	1,755	375	336	387	365	1,087
9......	498	326	375	875	400	365	1,301	365	336	375	365	1,140
10......	471	326	365	1,700	387	365	926	387	345	365	354	1,250
11......	471	319	354	2,270	375	387	825	400	336	365	365	1,195
12......	400	319	345	3,040	375	365	633	415	336	415	400	1,140
13......	387	319	345	2,850	365	354	498	387	336	400	633	1,087
14......	354	319	336	2,200	375	345	450	375	336	375	773	1,033
15......	354	326	336	1,640	387	336	415	375	336	375	773	1,033
16......	354	326	336	1,355	400	336	400	365	336	365	678	1,467
17......	354	326	319	1,087	375	336	633	354	336	365	594	1,815
18......	354	326	319	875	375	1,355	526	354	336	354	633	1,815
19......	375	326	319	825	375	1,640	415	354	326	354	1,250	1,355
20......	375	326	319	825	375	1,700	387	354	326	526	1,411	875
21......	387	345	319	594	365	1,301	365	387	336	724	1,033	724
22......	526	400	319	526	354	1,301	387	375	345	526	1,087	724
23......	594	400	319	450	375	1,250	375	375	345	431	1,140	724
24......	498	387	319	387	354	1,140	365	354	354	415	1,195	773
25......	415	400	311	375	354	875	354	345	345	387	980	825
26......	365	471	345	375	345	678	345	345	345	415	678	825
27......	354	387	678	365	400	526	345	365	345	400	526	875
28......	345	354	1,935	354	450	450	345	354	336	387	450	773
29......	326	......	2,665	345	431	471	345	354	336	387	415	875
30......	326	......	3,040	345	415	825	345	354	345	387	387	678
31......	326	......	2,850	......	400	......	345	415	......	375	......	773
Mean...	424	349	702	1,220	395	655	771	374	340	397	636	909

Mean Daily Discharge, Second-feet, of Clyde River at Clyde, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1......	1,755	1,087	375	678	633	304	296	304	282	282	268	319
2......	1,873	1,033	375	526	560	296	296	304	282	275	268	311
3......	2,000	1,033	773	450	560	296	289	304	282	275	289	304
4......	2,270	926	980	431	560	296	282	304	282	275	304	289
5......	2,850	825	594	415	526	296	282	304	282	282	296	289
6......	*a*	724	450	415	498	304	282	296	282	275	296	289
7......	*a*	633	431	415	450	296	282	296	282	275	311	289
8......	2,575	594	415	400	431	296	282	296	304	304	724	282
9......	2,418	560	400	375	431	289	282	296	289	319	926	282
10......	2,418	560	387	365	415	289	282	296	289	304	633	289
11......	2,130	498	387	375	415	282	282	296	289	289	415	319
12......	1,873	450	387	431	431	275	289	296	289	282	354	326
13......	1,525	450	415	450	415	275	289	296	282	282	326	319
14......	1,411	450	1,411	431	400	275	289	296	275	282	311	311
15......	1,525	450	1,640	400	387	275	289	289	275	282	304	336
16......	1,250	450	2,062	387	387	275	289	289	268	282	304	311
17......	1,467	450	2,850	365	375	275	289	289	268	282	296	304
18......	1,755	450	*a*	354	354	268	289	289	268	275	289	304
19......	1,755	431	*a*	345	354	268	289	289	268	268	289	304
20......	1,700	400	3,040	336	345	275	289	289	268	268	289	311
21......	1,700	415	2,340	319	326	282	289	289	268	275	289	304
22......	2,340	431	1,815	319	326	275	296	289	282	268	296	296
23......	2,270	431	1,755	319	319	268	304	289	275	261	289	304
24......	2,062	431	1,755	400	311	268	304	289	275	261	289	980
25......	2,000	415	1,700	773	311	275	304	289	275	261	289	1,525
26......	1,935	415	1,411	875	326	268	304	289	275	261	296	1,755
27	1,755	400	1,195	1,140	354	268	304	289	268	261	304	2,000
28......	1,580	375	1,355	1,195	336	268	304	289	268	282	311	2,000
29......	1,411	......	1,355	1,250	326	268	304	289	282	282	326	2,130
30......	1,250	......	1,301	1,250	311	275	206	289	282	275	326	2,200
31......	1,140	......	926	......	304	......	296	289	......	275	......	2,200
Mean...	1,862	563	1,182	539	402	280	292	293	279	278	350	703

a Discharge exceeds limits of rating curve.

Mean Daily Discharge, Second-feet, of Clyde River at Clyde, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
1.....	2,000	431	633	1,087	724	415	282	282	282	275	275	268
2.....	1,640	471	633	1,033	1,195	400	282	282	282	275	268	268
3.....	1,140	526	825	926	1,301	375	275	282	282	275	268	268
4.....	773	560	980	825	1,195	354	275	282	282	275	268	261
5.....	773	560	875	773	875	336	304	289	282	275	268	261
6.....	724	471	875	724	825	326	296	289	275	275	261	255
7.....	724	431	1,087	678	825	319	289	289	275	275	261	250
8.....	526	415	1,580	633	1,195	311	282	289	282	275	261	250
9.....	450	400	1,815	633	1,355	304	282	289	282	268	268	250
10.....	431	400	1,935	678	1,640	304	282	289	282	268	268	250
11.....	415	387	1,935	594	1,815	289	275	289	282	275	275	250
12.....	415	387	2,415	526	1,815	282	275	289	282	275	282	250
13.....	678	387	*a*	526	1,411	282	282	296	282	268	282	250
14.....	825	526	*a*	526	1,195	275	282	289	275	268	275	250
15.....	633	2,052	*a*	526	1,195	633	282	289	275	261	275	250
16.....	560	*a*	*a*	498	1,195	1,140	282	289	275	261	275	250
17.....	498	*a*	*a*	560	1,087	825	282	296	282	261	268	255
18.....	471	*a*	*a*	471	980	450	319	289	282	261	268	255
19.....	400	*a*	2,850	471	926	375	375	289	282	261	268	255
20.....	365	3,145	2,130	633	825	336	354	289	282	261	275	255
21.....	365	2,200	1,815	773	773	304	336	289	282	261	275	255
22.....	375	1,640	1,580	724	724	289	431	289	282	261	275	255
23.....	498	1,301	1,525	594	678	282	471	289	282	268	268	255
24.....	415	1,033	1,525	560	560	326	387	289	282	268	268	255
25.....	415	825	1,467	560	526	336	365	289	282	268	268	255
26.....	415	825	1,467	526	498	319	345	289	282	282	268	255
27.....	415	926	1,355	498	471	304	326	282	282	289	268	255
28.....	415	926	1,301	471	450	296	311	282	275	282	268	255
29.....	415	773	1,250	450	415	289	311	282	282	289	268	255
30.....	431	......	1,195	431	400	282	296	282	289	282	268	255
31.....	431	......	1,195	......	431	......	296	282	......	282	......	255
Mean...	614	880	1,450	630	592	379	314	287	281	272	270	255

a Discharge exceeds limits of rating curve.

Mean Daily Discharge, Second-feet, of Clyde River at Clyde, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1.....	319	345	1,935	1,355	1,250	......	275	282	292	289	261	256
2.....	311	336	1,250	1,195	1,873	315	277	282	289	289	261	256
3.....	255	326	926	926	2,945	311	275	282	289	286	258	256
4.....	255	311	678	724	2,665	308	275	282	286	282	258	261
5.....	250	289	504	633	2,130	326	282	289	282	282	261	257
6.....	250	326	526	594	1,935	326	261	289	282	282	263	268
7.....	250	825	498	560	1,755	322	275	289	278	278	261	264
8.....	250	526	471	498	1,640	311	261	286	275	282	256	261
9.....	282	375	471	450	1,580	304	268	282	282	282	264	258
10.....	268	326	678	415	1,467	300	275	282	282	286	252	259
11.....	275	311	1,467	450	1,467	304	268	278	282	289	255	258
12.....	282	304	1,525	471	1,467	311	289	286	289	289	255	255
13.....	282	304	1,301	471	1,195	300	292	282	296	289	252	250
14.....	275	304	875	633	980	296	282	282	292	289	252	255
15.....	268	311	594	1,467	875	289	282	282	289	282	252	256
16.....	289	345	560	1,815	1,087	289	282	289	286	275	255	261
17.....	282	304	450	1,640	1,250	286	282	296	282	275	271	261
18.....	282	289	365	1,355	1,087	282	282	308	282	261	301	257
19.....	275	282	400	1,170	825	275	289	296	289	261	303	257
20.....	275	319	375	773	633	275	289	296	292	264	295	258
21.....	268	825	354	678	594	275	288	296	296	268	284	256
22.....	268	825	336	633	471	275	282	296	304	264	275	261
23.....	311	1,195	336	526	450	275	289	289	296	272	272	250
24.....	498	1,935	326	431	431	275	289	289	296	272	264	255
25.....	594	*a*	375	415	400	268	289	296	296	268	261	255
26.....	387	*a*	926	400	375	268	282	300	289	278	256	257
27.....	326	*a*	1,033	387	365	270	289	300	282	278	256	258
28.....	304	3,040	1,195	387	365	282	289	296	282	278	256	260
29.....	336	......	1,467	387	354	282	289	289	289	278	256	261
30.....	375	......	1,525	498	345	282	289	289	289	261	256	261
31.....	375	......	1,411	......	345	......	282	289	......	264	......	261
Mean...	307	595	814	745	1,116	292	281	289	288	277	264	258

a Discharge exceeds limits of rating curve.

Monthly Discharge of Clyde River at Clyde, N. Y.

[Drainage area, 828 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1905.					
November	319	282	295	0.356	0.397
December	773	296	376	0.454	0.523
1903.					
January	633	326	424	0.512	0.590
February	471	319	349	0.421	0.438
March	3,040	311	702	0.848	0.978
April	3,040	345	1,220	1.47	1.64
May	526	345	395	0.477	0.550
June	1,700	336	655	0.791	0.882
July	2,200	345	771	0.931	1.07
August	450	336	374	0.452	0.521
September	354	326	340	0.411	0.459
October	724	345	397	0.479	0.552
November	1,411	354	636	0.768	0.857
December	1,815	345	909	1.10	1.27
1907.					
January	*a*2,850	1,140	1,862	2.25	2.59
February	1,087	375	563	0.680	0.708
March	*a*3,040	375	1,182	1.43	1.65
April	1,250	319	539	0.651	0.726
May	633	304	402	0.486	0.560
June	304	268	280	0.338	0.377
July	301	282	292	0.353	0.407
August	304	289	293	0.354	0.408
September	304	268	279	0.337	0.376
October	319	261	278	0.336	0.387
November	926	268	350	0.423	0.472
December	2,200	282	703	0.849	0.979
1908.					
January	2,000	365	614	0.742	0.855
February	*a*3,145	387	880	1.06	1.14
March	2,850	633	1,450	1.75	2.02
April	1,087	431	630	0.761	0.849
May	1,815	400	592	0.715	0.824
June	1,140	275	379	0.458	0.511
July	471	275	314	0.379	0.437
August	296	282	287	0.347	0.400
September	289	275	281	0.339	0.378
October	289	261	272	0.329	0.379
November	282	261	270	0.326	0.364
December	268	250	255	0.308	0.355
1909.					
January	594	250	307	0.371	0.428
February	*a*3,040	282	595	0.719	0.749
March	1,935	326	814	0.983	1.13
April	1,815	387	745	0.900	1.00
May	2,945	345	1,116	1.35	1.56
June	326	268	292	0.353	0.394
July	292	261	281	0.340	0.392
August	308	278	289	0.349	0.402
September	304	275	288	0.348	0.388
October	289	261	277	0.335	0.386
November	303	252	264	0.319	3.56
December	268	250	258	0.312	0.360

a Actual; maximum exceeds limits of rating curve.

CLYDE RIVER AT LYONS, N. Y.

A gage was established at Geneva street bridge in the village of Lyons, September 25, 1905, by this Department.* The gage is of the weight-and-box type and is attached to the down-stream side of the bridge on the right-hand span. The gage is divided decimally from zero to 14 feet. The elevation of the water-surface, when the gage reads zero, equals 390.00. Standard chain length 18.85. Readings are taken at 1 P. M. each day by men from the Barge canal office at Lyons. The gage is located below the inflow of Canandaigua outlet. The down-stream side of the bridge is subdivided at 5-foot intervals for current-meter measurements, the initial point being the face of the left-hand abutment.

The current-meter measurements available have enabled a fairly constant rating curve to be prepared for this station. The stream does not freeze over very extensively and the open water rating table has been applied in so far as seemed practicable throughout the year. The stream is more or less obstructed by aquatic vegetation at times in the summer, and the flow during the low-water season as estimated from the regular rating curve is probably less reliable than the calculated discharges for higher stages of the stream.

The bridge has two spans and extends squarely across the stream. The channel of the river is straight in the vicinity of the gage and the current is moderate and nearly uniform at ordinary stages and is confined to the main channel at nearly all stages. The Erie canal runs parallel with the Clyde river both at Clyde and at Lyons and the Clyde river receives some waste water from the canal.

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* See note following table of monthly discharge.

Current-meter Discharge Measurements of Clyde River at Lyons, N. Y.

DATE	Hydrographer.	GAGE READING.			Meter No.	Lateral interval.	Submergence depth.	Total area.	Total width	Computed discharge.	Velocity correction factor.	Corrected discharge.
		Beginning.	Ending.	Mean.								
1910.						Feet.		Square feet.	Feet.	Second-ft.		Second-ft.
June 14	H. V. Button	2.4	2.4	2.4	559	10	6/10	319.80	160	379.04	.978	370.70
Aug. 5	Newton and Button	1.59	1.59	1.59	559	5	6/10	178.06	152.9	74.99	.978	73.34
Aug. 31	A. R. Patchke.....	1.95	1.95	1.95	559	5	6/10	244.07	156	90.55	.978	88.56

Mean Daily Discharge, Second-feet, of Clyde River at Geneva St., Lyons, N. Y. [a]

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1.....	56	142	1,470	1,470	1,017	292	85	85	190	160	125	75
2.....	56	125	870	1,250	1,566	292	85	85	160	160	109	85
3.....	56	125	726	1,093	3,770	220	85	85	160	190	85	97
4.....	56	477	618	1,250	2,660	190	85	97	142	190	97	85
5.....	56	726	549	1,170	1,665	366	85	85	75	190	109	56
6.....	65	906	477	1,093	1,615	439	85	75	109	190	125	56
7.....	85	903	583	1,017	1,880	292	75	109	160	190	125	125
8.....	85	762	690	1,131	1,715	254	75	109	190	190	125	85
9.....	75	549	690	1,210	1,294	190	85	142	125	142	97	75
10.....	75	402	1,338	1,382	1,294	160	109	142	190	125	109	65
11.....	65	402	2,252	1,055	1,382	254	109	125	142	142	97	97
12.....	65	515	1,382	690	1,338	254	142	142	190	292	97	109
13.....	65	654	1,170	1,210	1,017	220	142	160	190	190	109	125
14.....	65	477	979	1,880	1,055	190	125	160	160	142	97	125
15.....	65	330	762	2,736	1,338	109	109	142	220	160	75	142
16.....	65	190	618	2,000	1,470	160	97	142	160	142	85	125
17.....	65	125	515	1,426	1,294	125	85	254	254	109	366	85
18.....	65	97	439	1,250	1,093	109	85	254	190	292	142	65
19.....	65	85	402	1,017	870	109	125	220	142	254	125	75
20.....	65	726	402	834	726	97	125	190	190	142	142	65
21.....	65	942	402	870	690	97	125	125	142	160	160	75
22.....	160	1,294	402	762	654	109	65	142	142	220	125	85
23.....	439	1,715	402	654	583	97	160	190	220	190	65	32
24.....	979	4,480	402	549	515	125	160	220	292	160	65	56
25.....	1,382	5,322	798	515	439	85	190	220	220	125	75	56
26.....	690	3,566	979	439	366	75	190	190	292	190	97	48
27.....	292	3,040	1,131	366	366	97	125	254	220	125	85	40
28.....	439	2,320	1,566	515	366	125	220	190	125	160	85	75
29.....	477	......	2,120	762	366	125	160	220	142	97	85	75
30.....	477	......	1,940	979	330	97	109	292	190	109	80	56
31.....	366	......	1,715	......	330	......	97	254	......	109	......	48
Mean...	228	1,121	932	1,086	1,131	178	116	165	177	169	112	79

Mean Daily Discharge, Second-feet, of Clyde River at Geneva St., Lyons, N. Y. [a]

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	48	220	2,736	439	1,294	549	190	190	515	160	190	330
2......	40	190	4,806	439	1,294	549	190	220	366	142	160	366
3......	56	220	5,158	402	1,665	439	190	292	515	125	142	366
4......	85	254	5,658	330	2,736	477	190	220	477	160	142	330
5......	56	292	6,136	402	2,516	515	190	190	583	125	142	292
6......	75	330	5,434	330	1,665	690	160	160	762	160	160	292
7......	97	366	5,546	330	1,250	762	190	160	942	220	160	292
8......	65	190	4,758	330	1,055	690	220	160	549	254	160	292
9......	75	160	3,690	330	979	583	220	254	583	220	160	330
10......	75	142	2,384	330	979	515	190	366	439	190	190	254
11......	125	109	1,742	330	906	477	254	330	366	190	254	160
12......	109	109	1,448	330	834	477	220	292	292	190	254	125
13......	97	125	1,250	292	726	477	439	190	330	190	220	160
14......	125	125	1,131	292	690	477	330	190	330	190	190	198
15......	85	190	870	254	654	402	190	190	366	125	190	220
16......	56	160	942	254	618	366	254	190	366	125	220	292
17......	65	292	906	254	583	330	254	142	330	125	330	330
18......	75	330	726	292	583	330	254	292	292	142	330	292
19......	125	330	726	330	583	330	330	254	254	142	366	254
20......	160	366	798	366	583	330	330	220	254	160	366	212
21......	190	366	942	477	583	292	254	292	190	160	330	175
22......	654	330	906	402	549	292	254	477	160	142	220	160
23......	1,055	330	798	402	477	292	160	477	160	125	160	125
24......	798	220	726	1,055	515	292	160	220	160	109	125	133
25......	618	292	654	2,812	690	292	220	190	190	160	190	142
26......	549	292	618	3,280	690	292	330	330	292	190	160	160
27......	439	402	583	2,964	549	292	402	190	254	190	160	175
28......	402	834	549	1,880	549	254	330	254	190	142	190	205
29......	402	......	515	1,382	549	220	402	366	190	142	220	160
30......	220	......	477	1,338	549	220	330	254	190	190	292	311
31......	254	......	477	......	549	......	254	330	......	330	......	375
Mean...	235	270	2,067	755	917	417	254	254	363	168	212	242

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[a] Not including water diverted from Canandaigua outlet for water-power purposes at Lyons.

Monthly Discharge of Clyde River at Geneva St., Lyons, N. Y. a

[Drainage area, 743 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1909.					
January	1,382	56	228	0.307	0.354
February	5,322	85	1,121	1.509	1.571
March	2,252	402	932	1.254	1.445
April	2,736	366	1,086	1.462	1.631
May	3,770	330	1,131	1.522	1.754
June	439	75	178	0.240	0.268
July	220	65	116	0.156	0.180
August	292	75	165	0.222	0.256
September	292	75	177	0.238	0.266
October	292	97	169	0.227	0.202
November	366	65	112	0.151	0.168
December	142	32	79	0.106	0.122
1910.					
January	1,055	40	235	0.316	0.364
February	834	109	270	0.363	0.378
March	6,136	477	2,067	2.782	3.207
April	3,280	254	755	1.016	1.134
May	2,736	477	917	1.234	1.423
June	762	220	417	0.561	0.626
July	402	160	254	0.342	0.394
August	477	142	254	0.342	0.394
September	942	160	363	0.489	0.546
October	330	125	168	0.226	0.261
November	366	125	212	0.285	0.318
December	375	125	242	0.326	0.376

a Not including power diversion.

NOTE.— This station was established to secure data of elevation rather than discharge. A part of the flow of Canandaigua outlet, which joins Ganargua creek just above the gage, is diverted past the gaging station in a water-power raceway. Data are not at present available which will permit the amount of such diversion to be included in the estimates here given.

CANANDAIGUA OUTLET.

DESCRIPTION.

Canandaigua lake occupies one of the elongated depressions extending in nearly a north and south direction in the central lake region of New York. The drainage tributary to the lake is chiefly short lateral streams from the steep slopes of adjacent hillsides. The outflow from the lake is regulated to some extent by gates. The lake is at elevation about 686. From the foot of the lake at Canandaigua the outlet flows a little north to Manchester, a distance of 7 miles. In this distance a fall of 100 feet occurs, which is chiefly concentrated at several water-power dams. From Manchester the stream flows easterly 12 miles and thence northeasterly 8 miles joining Ganargua creek at Lyons to form the Clyde river. In the easterly portion of its course the stream winds with large bends through a broad sloping valley of fertile land. The fall is mostly utilized at water-power dams. The tributary drainage is moderately rolling and is interspersed with glacial kames. These are lenticular hills extending usually in a north and south direction. At Phelps, Flint creek, which is the largest tributary, enters the outlet. Flint creek drains a valley similar to the adjacent lake basins. This valley is not at present occupied by a lake, but contains an extensive swamp, reaching several miles southward from Gorham.

CANANDAIGUA OUTLET AT ALLOWAY, N. Y.

This gaging station was established September 18, 1906, by F. P. Williams for this Department. It is located at a highway bridge crossing the stream 2½ miles above Lyons. The gage has a vertical scale divided decimally and reading from zero to 10 feet. It is attached to the down-stream face of the left-hand abutment of the bridge and has its zero mark at elevation 403.32. Current-meter discharge measurements are made from the down-stream side of the bridge, which has a span of 95 feet between abutments.

Current-meter Discharge Measurements of Canandaigua Outlet at Alloway, N.Y.

DATE.	Hydrographer.	GAGE READING.			Meter No.	Lateral interval	Submergence depth.	Total area.	Total width.	Computed discharge.
		Beginning.	Ending.	Mean.						
1910.						*Feet.*		*Square feet.*	*Feet.*	*Second-feet.*
June 14...	H. V. Button.......	1.5	1.5	1.5	559	5	6/10	273.58	85	288.67
Aug. 5...	Newton and Button..	0.4	0.4	0.4	559	5	6/10	176.03	82	57.11
Aug. 31...	A. R. Patchke.......	0.2	0.4	0.3	559	5	6/10	166.31	80	59.45

Mean Daily Discharge, Second-feet, of Canandaigua Outlet at Alloway, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	136	207	*a*	412	984	360	232	76	114	76	158	136
2.....	114	207	*a*	386	984	360	183	76	114	76	158	158
3.....	114	207	*a*	360	*a*	360	158	54	114	76	136	158
4.....	114	258	*a*	360	*a*	360	207	54	136	93	114	158
5.....	136	258	*a*	360	*a*	360	258	64	158	114	114	183
6.....	158	258	*a*	360	*a*	412	284	76	232	114	114	207
7.....	158	284	*a*	336	907	468	207	76	258	114	93	207
8.....	158	284	*a*	310	870	440	158	76	258	114	76	207
9.....	136	258	*a*	310	828	412	114	76	258	93	76	207
10.....	114	258	*a*	310	788	412	93	93	181	76	76	158
11.....	158	207	984	310	747	412	76	114	158	76	114	158
12.....	158	207	870	310	747	412	76	93	136	76	114	158
13.....	158	207	788	310	708	360	183	76	114	76	114	158
14.....	136	207	708	310	670	360	183	76	136	114	136	183
15.....	114	232	670	258	594	360	158	76	158	114	158	258
16.....	114	258	670	258	559	336	93	76	158	114	158	232
17.....	114	232	594	258	526	310	76	76	158	114	136	207
18.....	114	207	468	284	498	310	76	93	158	114	114	207
19.....	114	207	468	310	468	310	76	114	136	114	114	207
20.....	158	258	468	310	468	310	76	114	114	114	114	258
21.....	158	258	468	310	468	310	114	114	114	114	114	232
22.....	559	258	526	336	468	310	114	114	114	114	114	207
23.....	498	310	498	386	468	310	114	93	114	114	114	158
24.....	468	310	468	632	526	310	114	76	114	114	114	158
25.....	386	310	468	*a*	526	310	114	76	114	114	114	158
26.....	232	310	440	*a*	468	310	93	76	93	114	114	207
27.....	207	310	412	*a*	468	310	76	76	76	114	76	258
28.....	183	747	412	*a*	468	310	76	76	76	114	93	232
29.....	207	......	412	*a*	412	310	76	93	76	114	114	207
30.....	207	......	412	*a*	412	310	76	114	76	114	114	258
31.....	183	......	412	......	386	......	76	114	......	158	......	258
Mean.	192	268	......	......	......	351	129	86	141	105	116	198

a Gage height beyond limits of rating curve.

Monthly Discharge of Canandaigua Outlet at Alloway, N. Y.
[Drainage area, 440 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
January	559	114	192	0.436	0.503
February	747	207	268	0.609	0.634
June	468	310	351	0.798	0.890
July	284	76	129	0.293	0.338
August	114	54	86	0.195	0.225
September	258	76	141	0.320	0.357
October	158	76	105	0.239	0.276
November	158	76	116	0.264	0.294
December	258	136	198	0.450	0.519

FLINT CREEK DRAINAGE BASIN.

Flint creek is a tributary to Canandaigua outlet, entering the outlet at Phelps. Flint creek rises in northern Steuben county near the junction of the Ontario, Yates and Steuben county lines.

It flows in general northeasterly, having a total length of 35 miles. The drainage basin is relatively long and narrow, and the stream valley above Gorham, about 14 miles from the mouth, comprises a deep narrow valley bordered by steep and in some cases precipitous slopes, the bottom of the valley being relatively flat and having an average width of about one mile. The elevation of the valley is about 880 feet above tide. This valley is intermediate between and nearly parallel with Keuka and Canandaigua lakes, and it is apparently an unoccupied lake bottom of the finger lake series. Between the villages of Potter and Gorham the bottom of the valley is occupied by an extensive marsh, having a length of about 8 miles and an average width of one mile. Flint creek enters the head of this marsh at Potter and leaves the marsh at Gorham. Short lateral tributaries enter the marsh from the steep side slopes. The marsh is largely timber covered. There is a water-power dam at Gorham, which controls the level of Flint creek at the outlet from the marsh. Power is developed for small mills at Orleans, Flint, Stanton and other places. Above the head of Gorham marsh the sides of the stream valley rise to a height of 800 to 1,000 feet above the stream. The valley slopes are generally rounded and not serrated as in the case of most of the other slopes bordering finger lake valleys and there are but few permanent tributaries to upper Flint creek.

FLINT CREEK AT PHELPS, N. Y.

A gaging station was established on Flint creek at a private highway bridge located about one-quarter mile south of Phelps Junction, on August 5, 1910, by J. P. Newton for this Department. The observer is Edward Fitzgerald. Readings are taken each morning and night from a standard weight-and-chain gage located on the down-stream side of the bridge. The stream channel is fairly straight and uniform above and below the gage, but the bed of the stream is rock and contains some loose boulders, especially near the margins of the stream.

Current-meter measurements are made by wading or from the down-stream side of the bridge, according to the condition of the stream.

The datum of the gage is referred to an arbitrary bench-mark, elevation 100.00, on the down-stream side of the right-hand abutment. The elevation of water-surface, when the gage reads zero, is 95.86.

Mean Daily Gage Height, in Feet, of Flint Creek at Phelps, N. Y.

DAY.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.					
1	......	0.75	0.68	0.80	1.08
2	......	0.72	0.65	0.82	1.08
3	......	0.75	0.65	0.78	1.15
4	......	0.80	0.68	0.85	0.98
5	0.65	0.85	0.72	0.88	1.20
6	0.70	1.57	0.85	0.82	1.18
7	0.65	1.40	0.92	0.78	1.20
8	0.65	1.12	0.82	0.75	1.20
9	0.60	0.98	0.72	0.75	1.30
10	0.78	0.90	0.70	0.92	1.08
11	0.85	0.88	0.72	0.88	0.95
12	0.75	0.98	0.70	0.90	1.00
13	0.72	1.00	0.70	0.85	1.05
14	0.68	0.85	0.70	1.12	1.15
15	0.65	0.82	0.70	1.08	1.05
16	0.62	0.92	0.72	1.10	1.00
17	0.60	1.08	0.70	0.82	0.92
18	0.60	0.85	0.78	1.00	0.90
19	0.78	1.00	0.80	1.00	1.00
20	0.72	1.02	0.82	0.92	0.92
21	0.68	0.75	0.82	0.98	0.98
22	0.70	0.92	0.90	1.05	1.10
23	0.65	0.92	0.90	0.95	1.00
24	0.60	0.78	0.92	0.98	1.08
25	0.58	0.75	0.98	1.00	0.95
26	0.60	0.70	0.88	0.95	0.90
27	0.58	0.72	0.80	0.85	1.00
28	0.55	0.70	0.75	1.05	1.05
29	0.55	0.68	0.75	1.08	1.12
30	0.50	0.70	0.78	1.05	1.02
31	0.50	......	0.80	......	1.05

CANANDAIGUA LAKE AT CANANDAIGUA, N. Y.

A gaging station was established by A. T. Clark for this Department, September 10, 1909, at the foot of Canandaigua lake in the village of Canandaigua. The gage consists of two 5-foot enameled steel sections reading to feet and tenths, attached vertically to dock piling at the shore end of the boat-house pier near the lake outlet. The zero mark of the gage has not been determined with reference to Barge canal datum. This gage is read twice each day and shows the water-level in Canandaigua lake.

Mean Daily Gage Height, in Feet, of Canandaigua Lake at Canandaigua, N. Y.

DAY.	Sept.	Oct.	Nov.	Dec.
1909.				
1	......	5.0	4.8	4.6
2	......	5.1	4.8	4.6
3	......	5.0	4.6	4.6
4	......	5.0	4.8	4.6
5	......	5.0	4.8	4.5
6	......	5.0	4.8	4.5
7	......	5.0	4.6	4.5
8	......	5.0	4.6	4.5
9	......	5.0	4.8	4.5
10	5.55	5.0	4.8	4.5
11	5.5	5.0	4.8	4.5
12	5.5	5.0	4.8	4.4
13	5.5	5.0	4.7	4.4
14	5.4	4.9	4.6	4.4
15	5.5	4.9	4.8	4.4
16	5.5	4.8	4.8	4.4
17	5.4	4.8	4.7	4.4
18	5.4	4.9	4.8	4.4
19	5.3	4.9	4.8	4.4
20	5.3	4.6	4.7	4.4
21	5.3	4.8	4.7	4.4
22	5.1	4.9	4.7	4.3
23	5.3	4.9	4.6	4.3
24	5.3	4.9	4.7	4.3
25	5.3	4.8	4.7	4.3
26	5.2	4.6	4.7	4.3
27	5.2	4.6	4.6	4.3
28	5.2	4.6	4.6	4.3
29	5.0	4.9	4.6	4.3
30	5.0	4.9	4.6	4.2
31	......	4.7	......	4.2

Mean Daily Gage Height, in Feet, of Canandaigua Lake at Canandaigua, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	4.30	4.60	5.30	6.80	7.50	6.70	6.00	5.80	5.60	5.50	5.10	4.9
2	4.30	4.60	5.70	6.80	7.50	6.70	5.90	5.70	5.60	5.50	5.10	4.9
3	4.30	4.60	5.90	6.70	7.50	6.70	5.90	5.70	5.60	5.50	5.10	4.9
4	4.30	4.60	6.20	6.70	7.40	6.70	5.90	5.70	5.60	5.50	5.10	4.9
5	4.30	4.60	6.50	6.70	7.50	6.70	5.90	5.70	5.70	5.50	5.10	4.9
6	4.30	4.60	6.70	6.70	7.50	6.70	5.80	5.70	5.70	5.40	5.10	4.9
7	4.30	4.60	6.80	6.70	7.50	6.70	5.80	5.60	5.80	5.40	5.10	4.9
8	4.30	4.60	6.90	6.70	7.50	6.70	5.80	5.60	5.80	5.40	5.10	4.9
9	4.30	4.60	6.90	6.70	7.40	6.60	5.80	5.60	5.80	5.40	5.10	4.9
10	4.30	4.60	6.90	6.70	7.40	6.60	5.80	5.60	5.80	5.40	5.10	4.9
11	4.30	4.60	6.90	6.70	7.40	6.60	5.80	5.70	5.70	5.40	5.10	4.8
12	4.30	4.60	7.00	6.70	7.30	6.60	5.80	5.70	5.70	5.40	5.10	4.8
13	4.30	4.70	7.00	6.50	7.30	6.60	5.80	5.70	5.70	5.40	5.10	4.8
14	4.30	4.70	7.00	6.60	7.30	6.50	5.80	5.70	5.70	5.40	5.10	4.8
15	4.30	4.70	6.90	6.60	7.20	6.50	5.80	5.70	5.60	5.40	5.10	4.8
16	4.30	4.70	6.90	6.60	7.00	6.50	5.80	5.70	5.60	5.40	5.00	4.8
17	4.40	4.70	6.90	6.60	7.00	6.50	5.70	5.70	5.60	5.30	5.00	4.8
18	4.40	4.70	6.90	6.60	7.00	6.50	5.70	5.70	5.60	5.30	5.00	4.8
19	4.40	4.80	6.80	6.60	6.90	6.40	5.70	5.60	5.60	5.30	5.00	4.8
20	4.40	4.80	6.80	6.60	6.90	6.40	5.70	5.60	5.60	5.30	5.00	4.8
21	4.40	4.80	6.90	6.50	6.90	6.40	5.70	5.60	5.60	5.30	5.00	4.8
22	4.40	4.80	6.90	6.70	6.90	6.40	5.70	5.60	5.60	5.30	5.00	4.8
23	4.40	4.80	6.90	6.80	6.80	6.30	5.70	5.60	5.50	5.30	5.00	4.8
24	4.40	4.90	6.90	6.90	6.80	6.20	5.70	5.60	5.50	5.20	5.00	4.7
25	4.40	4.90	6.90	7.00	6.80	6.20	5.70	5.60	5.50	5.20	5.00	4.7
26	4.50	4.90	6.80	7.30	6.80	6.20	5.70	5.60	5.50	5.20	5.00	4.7
27	4.50	4.90	6.90	7.40	6.80	6.10	5.70	5.50	5.50	5.20	5.00	4.7
28	4.50	4.90	6.90	7.40	6.70	6.10	5.80	5.50	5.50	5.20	5.00	4.7
29	4.50	......	6.90	7.40	6.70	6.00	5.80	5.50	5.50	5.20	5.00	4.7
30	4.50	......	6.80	7.50	6.80	6.00	5.80	5.50	5.50	5.10	5.00	4.7
31	4.50	......	6.80	......	6.80	......	5.80	5.50	......	5.10	......	4.7

IRONDEQUOIT CREEK DRAINAGE BASIN.

DESCRIPTION.

Irondequoit creek is tributary to the Irondequoit bay about six miles east of Rochester. The drainage basin of the stream is shown on the Macedon, Rochester, Honeoye and Canandaigua quadrangles of the United States Geological Survey topographic maps. The head of the stream is in Mendon pond at elevation 662 above tide. The outlet from this pond flows southeasterly, turning to the north before it reaches Fishers village. The stream flows thence in a generally northerly direction, crossing the Erie canal between Pittsford and Bushnell's Basin. At Dispatch, Thomas creek, a large tributary, enters from the east. This tributary receives a considerable amount of waste and overflow waters from the Erie canal, with which it runs parallel for several miles.

The topography of Irondequoit creek drainage basin is generally broken and irregular. The surface soil is, as a rule, very sandy and there are numerous springs and a relatively large supply of ground water, which feeds the stream and maintains a relatively uniform flow. There are a number of undrained depressions in the drainage basin. Most of these do not contain lakes, the surface water-supply being disposed of by evaporation and infiltration. Aside from marshes surrounding Mendon ponds there are several small swamp areas. There are a number of small mills and water power developments on the stream.

Drainage Areas of Irondequoit Creek.
(From U. S. G. S. Topographic Maps.)

LOCALITY.	AREA IN SQUARE MILES.	
	Place to place.	Total.
Irondequoit creek.		
Head to Mendon	21.89	21.89
Mendon to gaging station	19.77	41.66
Gaging station to Jaeske's mill *a*	7.96	49.62
Jaeske's mill to junction with Thomas creek	13.14	62.76
Thomas creek above mouth	34.15	96.91
Thomas creek to Allen creek	7.81	104.72
Allen creek above mouth	26.56	131.28
Allen creek to lower dam *b*	6.57	137.85
Lower dam to head of bay	13.72	151.57

a Erie canal crossing. *b* Two miles below Penfield.

IRONDEQUOIT CREEK NEAR PITTSFORD, N. Y.

A gaging station was established on Irondequoit creek near Pittsford, N. Y., by A. T. Clark for this Department, June 5, 1910. A vertical enameled steel gage 5 feet in length, subdivided to feet and tenths, is attached to a tree a short distance downstream from the first highway bridge crossing the creek above the Erie canal. The gage was read by Wm. Schell each morning and night from June 5 to December 31, 1910, inclusive. The station was discontinued December 31, 1910. Current-meter measurements were made from the highway bridge adjacent to the gage. The measurements available are sufficient for the determination of a fairly good low-water discharge curve, from which the results here given are deduced.

Mean Daily Gage Height, in Feet, of Irondequoit Creek near Pittsford, N. Y.

DAY.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.							
1	......	1.35	1.30	1.95	1.40	1.55	1.85
2	......	1.35	1.35	1.75	1.40	1.55	1.80
3	......	1.40	1.25	1.75	1.45	1.50	2.00
4	......	1.40	1.35	2.25	1.35	1.55	1.75
5	1.50	1.30	1.40	1.80	1.40	1.60	1.85
6	2.20	1.25	1.40	4.40	1.65	1.50	1.75
7	2.00	1.35	1.30	2.40	2.10	1.50	1.75
8	1.80	1.65	1.30	1.65	1.60	1.55	1.65
9	1.60	1.35	1.30	1.85	1.50	1.50	1.70
10	1.60	1.40	1.50	1.65	1.50	1.70	1.70
11	1.55	1.50	1.50	1.50	1.50	1.75	1.50
12	1.85	1.45	1.40	1.50	1.45	1.55	1.65
13	1.60	1.75	1.40	1.65	1.40	1.60	1.55
14	1.60	1.45	1.35	1.60	1.45	1.60	1.50
15	1.55	1.35	1.35	1.55	1.40	1.55	1.45
16	1.50	1.40	1.30	1.55	1.45	1.60	1.75
17	1.40	1.40	1.30	1.50	1.40	1.65	1.70
18	1.50	1.40	1.30	1.40	1.40	1.65	1.60
19	1.45	1.30	1.40	1.45	1.40	1.60	1.60
20	1.45	1.35	1.40	1.45	1.40	1.50	1.55
21	1.40	1.25	1.35	1.40	1.40	1.55	1.75
22	1.45	1.35	1.30	1.45	1.55	1.50	1.70
23	1.40	1.35	1.35	1.45	1.55	1.50	1.55
24	1.45	1.30	1.30	1.45	1.55	1.55	1.50
25	1.35	2.00	1.30	1.40	1.75	1.65	1.60
26	1.35	1.55	1.35	1.45	1.90	1.65	1.70
27	1.35	1.40	1.40	1.45	1.65	1.60	1.55
28	1.35	1.40	1.35	1.35	1.60	1.90	1.55
29	1.35	1.30	1.35	1.40	1.60	1.80	1.75
30	1.30	1.25	1.30	1.40	1.60	2.05	1.90
31	......	1.30	1.35	......	1.55	......	2.60

Current-meter Discharge Measurements of Irondequoit Creek at Pittsford, N. Y.

DATE.	Hydrographer.	GAGE READING.			Meter No.	Lateral interval.	Submergence depth.	Area flowing	Total area.	Total width.	Computed discharge.
		Beginning.	Ending.	Mean.							
1910.						*Feet.*		*Square feet.*	*Square feet.*	*Feet.*	*Second-feet.*
June 18 *a*	Patchke & Moulton..........	1.65	1.65	1.65	360	2.5	6/10	33.87	33.87	22.5	43.16
Aug. 4 *b*	Newton & Button	1.40	1.40	1.40	559	2.5	6/10	36.00	38.99	23.7	22.59
Sept. 22 *a*	A. T. Clark......	1.30	1.30	1.30	559	2.5	6/10	23.08	23.08	21.5	12.52
Sept. 23 *a*	A. T. Clark......	1.35	1.35	1.35	559	2.5	6/10	24.93	24.93	21.5	13.33

a Down-stream side of bridge. *b* Up-stream side of bridge.

Mean Daily Discharge, Second-feet, of Irondequoit Creek near Pittsford, N. Y.

DAY.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.							
1	......	15.0	12.5	75.0	19.5	33.5	63.5
2	......	15.0	15.0	53.5	19.5	33.5	58.5
3	......	19.5	9.5	53.5	24.0	28.5	81.5
4	......	19.5	15.0	*a*	15.0	33.5	53.5
5	28.5	12.5	19.5	58.5	19.5	37.5	63.5
6	*a*	9.5	19.5	*a*	43.0	28.5	53.5
7	81.5	15.0	12.5	*a*	*a*	28.5	53.5
8	58.5	43.0	12.5	43.0	37.5	33.5	43.0
9	37.5	15.0	12.5	63.5	28.5	28.5	48.5
10	37.5	19.5	28.5	43.0	28.5	48.5	48.5
11	33.5	28.5	28.5	28.5	28.5	53.5	28.5
12	63.5	24.0	19.5	28.5	24.0	33.5	43.0
13	37.5	53.5	19.5	43.0	19.5	37.5	33.5
14	37.5	24.0	15.0	37.5	24.0	37.5	28.5
15	33.5	15.0	15.0	33.5	19.5	33.5	24.0
16	28.5	19.5	12.5	33.5	24.0	37.5	53.5
17	19.5	19.5	12.5	28.5	19.5	43.0	48.5
18	28.5	19.5	12.5	19.5	19.5	43.0	37.5
19	24.0	12.5	19.5	24.0	19.5	37.5	37.5
20	24.0	12.5	19.5	24.0	19.5	28.5	33.5
21	19.5	9.5	15.0	19.5	19.5	33.5	53.5
22	24.0	15.0	12.5	24.0	33.5	28.5	48.5
23	19.5	15.0	15.0	24.0	33.5	28.5	33.5
24	24.0	12.5	12.5	24.0	33.5	33.5	28.5
25	15.0	81.5	12.5	19.5	53.5	43.0	37.5
26	15.0	33.5	15.0	24.0	69.0	43.0	48.5
27	15.0	19.5	19.5	24.0	43.0	37.5	33.5
28	15.0	19.5	15.0	15.0	37.5	69.0	33.5
29	15.0	12.5	15.0	19.5	37.5	58.5	53.5
30	12.5	9.5	12.5	19.5	37.5	89.0	69.0
31	......	12.5	15.0	......	33.5	......	*a*
Mean	30.0	21.0	15.8	33.4	29.5	39.4	45.8

a Above limit of rating curve.

Monthly Discharge of Irondequoit Creek near Pittsford, N. Y.

[Drainage area, 41.7 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.			RUN-OFF.	
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
June	....	12.5	30.0	0.719	0.802
July	81.5	9.5	21.0	0.504	0.581
August	28.5	9.5	15.8	0.379	0.437
September	75.0[a]	15.0	33.4	0.801	0.894
October	69.0[a]	15.0	29.5	0.707	0.815
November	89.0	28.5	39.4	0.945	1.054
December	81.5[a]	24.0	45.8	1.098	1.266

[a] Maximum above limit of rating curve.

GENESEE RIVER DRAINAGE BASIN.

GENESEE RIVER.

DESCRIPTION.

Genesee river rises in Potter county, Pa., eight or ten miles south of the New York-Pennsylvania boundary, flows northwestward for about thirty-two miles by general course, then turns to the northeast and empties into Lake Ontario, seven miles north of Rochester. The entire length of the stream, following bends, is about 135 miles, and the drainage area is about 2,450 square miles.

In the northern counties the surface is rolling, with long, easy slopes, except along the streams, which usually lie in deep ravines, hemmed in by steep banks. On the whole there is a gradual rise away from the lakes, and in the upper half of the basin the country becomes rough and is broken by ridges, the summits of which attain elevations of from 2,000 to 2,500 feet above tide.

In the thirty-nine miles between Belmont, in central Allegany county, and Portage, in southwestern Livingston county, the fall of the water-surface is 253 feet, an average of 6.4 feet per mile. At Portage the river plunges down in three magnificent falls, and thence nearly to Mount Morris flows at the bottom of a deep gorge. From Mount Morris to Rochester the valley is broad and open and the stream is bordered by meadows subject to occasional overflow. At Rochester there is another abrupt descent over three heavy falls, amounting to about 260 feet within the city.

The series of remarkable lakes tributary to the Oswego basin is continued westward into the basin of the Genesee and includes Conesus, Hemlock, Canadice, and Honeoye lakes. These lakes serve as natural reservoirs and have inlets draining considerable areas at their upper ends. The slopes adjacent to the lakes themselves are narrow and steep and are drained by gulleys and torrential brooks. The area below the lakes is rolling and the soil is rich and extensively cultivated. The areas and elevations of these lakes are shown in the following table:

Areas and Elevations of Lakes in Genesee River Basin. [a]

LAKE.	Elevation.	Water-surface area.	Drainage area.	Per cent water-surface.
	Feet.	*Square miles.*	*Square miles.*	
Hemlock lake	896	2.8	46.8	6.12
Canadice lake	1,092	.7	12.6	5.57
Honeoye lake	800	2.5	39.6	6.41

[a] These lake basins are shown on the Honeoye, Canandaigua, Naples and Wayland topographic atlas sheets of the United States Geological Survey, from which the areas have been taken, with the exception of those for Hemlock and Canadice lakes, which are from surveys of Rochester water works.

Above all the private dams at Rochester the State formerly maintained a dam for diverting water to the Erie canal, and in the basin of Black creek, one of the upper tributaries of the Genesee from the west, are two reservoirs (Rockville and Cuba reservoirs), owned by the State, also used for the benefit of the Erie canal.

Cuba reservoir, on the Genesee-Allegheny divide, receives the drainage from a tributary area of 26.6 square miles. The storage volume is 454,000,000 cubic feet. The overflow from this reservoir enters Allegheny river. The storage water may be turned into the summit level of the abandoned Genesee Valley canal and thence into Genesee river.

Drainage Areas of Tributaries of Genesee River. [a]

NAME OF STREAM.	AREA IN SQUARE MILES.		
	Tributary.	GENESEE RIVER.	
		Above tributary.	Below tributary.
Cryder creek	43.3	99.9	143.2
Chenunda creek	30.0	181.0	210.0
Dyke's creek	68.3	214.0	282.3
Vandermark creek	21.6	301.3	322.9
Knight's creek	22.3	323.9	346.2
Phillips creek	32.3	372.8	405.1
Vancampens creek	55.7	410.4	466.1
Angelica creek	82.1	481.1	563.2
White creek	15.9	569.2	585.1
Black creek	31.1	595.5	626.6
Crawford creek	11.8	637.6	649.4
Caneadea creek	63.3	651.0	714.3
Cold creek	41.0	745.3	786.3
Rush creek	35.3	787.0	822.3
Wiscoye:			
East Coy creek	59.9	....	....
West Coy creek	48.7	833.6	942.2
Wolf creek	19.3	974.9	994.2
Silver Lake outlet	30.4	1,029.2	1,059.6
Coshaqua creek	82.0	1,059.6	1,141.6
Canaseraga creek	258.7	1,148.4	1,407.1
Beards creek	41.3	1,423.1	1,464.4
Conesus Lake outlet	88.8	1,555.5	1,643.9
Honeoye creek	262.6	1,675.9	1,938.5
Allen's creek	193.1	1,947.1	2,145.2
Black creek	211.8	2,168.5	2,380.0
Genesee river, total at mouth	....	....	2,445.6

[a] From an early report on Genesee river storage.

Mean Daily Elevations of Water-surface (Barge Canal Datum) of Genesee River at Elmwood Ave. Rochester, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	507.73	508.73	513.28	508.93	512.73	508.53	507.73	507.73	507.73	508.03	507.93	509.43
2	507.73	508.73	......	508.93	512.13	508.53	507.73	507.73	507.73	508.03	508.03	509.23
3	507.73	508.73	516.53	508.73	513.33	508.53	507.73	507.73	507.73	508.03	508.03	508.93
4	507.73	508.73	517.68	508.63	514.23	508.43	507.73	507.73	507.83	508.03	508.03	508.93
5	507.73	508.73	517.68	508.63	514.13	508.43	507.73	507.73	508.33	508.03	508.03	508.93
6	507.73	508.73	517.03	508.63	512.13	508.43	507.73	507.73	508.53	508.03	508.03	508.83
7	507.73	508.73	516.58	508.53	510.83	508.53	507.73	507.73	509.03	508.13	508.03	508.83
8	507.73	508.63	516.28	508.53	510.23	508.53	507.73	507.73	508.63	508.33	508.03	508.73
9	507.73	508.63	515.88	508.53	509.83	508.53	507.73	507.73	508.43	508.33	508.03	508.73
10	507.73	508.53	514.63	508.53	509.73	508.43	507.73	507.73	508.33	508.23	508.03	508.73
11	507.73	508.43	512.13	508.43	509.53	508.43	507.73	507.73	508.13	508.13	508.13	508.73
12	507.73	508.43	511.03	508.43	509.23	508.43	507.73	507.73	507.93	508.13	509.03	508.63
13	507.73	508.43	510.73	508.33	509.23	508.43	507.83	507.73	507.83	507.93	508.83	508.53
14	507.73	508.43	510.53	508.33	509.03	508.33	507.93	507.73	507.83	507.93	508.63	508.53
15	507.73	508.43	510.23	508.23	508.83	508.33	508.03	507.73	507.83	507.93	508.63	508.43
16	507.73	508.43	509.93	508.23	508.73	508.23	508.03	507.73	507.83	507.93	508.63	508.33
17	507.73	508.63	509.73	508.23	508.73	508.23	508.03	507.73	507.83	507.83	508.63	508.23
18	507.93	509.13	509.63	508.43	508.73	508.13	508.03	507.73	507.83	507.83	508.63	508.23
19	508.03	509.73	509.43	508.63	508.63	508.13	507.93	507.73	507.83	507.83	508.63	508.23
20	508.33	509.73	509.43	509.53	508.63	508.13	507.93	507.73	507.73	507.73	508.63	508.23
21	510.33	509.73	511.83	510.23	508.53	508.13	507.83	507.73	507.73	507.73	508.53	508.13
22	510.73	509.73	511.63	510.03	508.43	508.03	507.73	507.73	507.73	507.73	508.43	508.13
23	511.73	509.73	511.03	509.93	508.33	508.03	507.73	507.73	507.73	507.73	508.33	508.03
24	511.83	509.73	510.93	510.03	508.43	508.03	507.73	507.73	507.73	507.73	508.33	508.03
25	510.73	509.73	510.73	513.53	508.63	507.93	507.73	507.73	507.73	507.83	508.33	508.03
26	510.33	509.73	510.73	514.33	508.73	507.93	507.73	507.73	507.73	507.93	509.23	508.03
27	509.93	509.73	510.23	514.93	508.73	507.93	507.73	507.73	507.83	507.93	509.33	508.03
28	509.53	509.73	509.73	514.93	508.73	507.83	507.73	507.73	507.83	507.93	509.03	508.03
29	509.33	......	509.43	513.53	508.63	507.83	507.73	507.73	507.93	507.93	509.03	508.23
30	508.93	......	509.23	513.23	508.63	507.83	507.73	507.73	508.03	507.93	509.53	509.33
31	508.73	......	509.03	......	508.53	......	507.73	507.73	......	507.93	......	511.23

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Genesee River at Ballantine Bridge Scottsville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	507.80	509.70	517.80	509.90	516.70	508.90	507.90	507.80	507.70	508.00	508.20	510.50
2......	507.80	509.70	520.35	509.60	514.70	509.00	507.90	507.80	507.80	508.00	508.20	509.90
3......	507.80	509.40	521.85	509.40	516.60	508.90	507.80	507.80	507.90	508.00	508.10	509.60
4......	507.80	509.50	522.15	509.30	518.00	508.90	507.80	507.80	508.00	508.00	508.10	509.40
5......	507.90	509.50	523.15	509.20	518.60	508.80	507.80	507.80	508.10	508.00	508.00	509.10
6......	508.40	509.10	522.50	509.20	516.40	509.10	507.80	507.80	508.70	508.10	508.00	509.30
7......	508.40	509.20	522.00	509.10	513.70	509.00	507.80	507.80	509.70	508.10	508.00	509.50
8......	508.30	509.40	521.70	509.10	512.40	508.90	507.80	507.70	509.30	508.20	508.00	509.60
9......	508.30	508.70	521.10	509.00	511.80	508.80	507.80	507.70	508.90	508.40	508.00	509.60
10......	508.20	508.80	519.20	509.00	511.20	508.70	507.80	507.70	508.70	508.30	508.20	509.30
11......	508.20	509.20	515.10	508.80	510.90	508.60	507.80	507.70	508.30	508.20	508.40	509.10
12......	508.20	509.40	513.40	508.80	510.50	508.60	507.80	507.70	508.10	508.10	509.70	508.90
13......	508.20	509.00	513.00	508.80	510.20	508.70	507.90	507.70	508.00	508.00	509.50	509.00
14......	508.20	508.90	512.90	508.70	509.90	508.60	507.90	507.70	508.10	508.00	509.20	508.90
15......	508.20	508.80	512.60	508.70	509.70	508.50	508.00	507.70	508.00	508.00	509.10	508.70
16......	508.10	508.60	511.60	508.70	509.50	508.50	508.20	507.70	508.00	508.00	509.10	508.70
17......	508.10	508.90	511.30	508.60	509.30	508.40	508.10	507.70	508.00	507.90	509.00	508.60
18......	508.10	509.50	511.00	508.70	509.20	508.40	508.00	507.70	508.00	507.80	509.00	508.60
19......	508.20	510.80	510.70	509.00	509.10	508.40	508.00	507.70	507.90	507.80	508.90	508.70
20......	508.50	511.10	511.00	510.60	509.10	508.30	507.90	507.70	507.90	508.00	508.80	508.70
21......	511.20	510.90	514.25	511.70	509.00	508.30	507.90	507.70	507.90	508.00	508.80	508.80
22......	512.10	510.90	514.40	511.80	508.90	508.30	507.90	507.70	507.90	508.00	508.80	509.00
23......	515.10	511.10	513.40	511.70	508.90	508.20	507.90	507.70	507.90	508.00	508.80	508.70
24......	516.00	511.10	513.30	510.90	508.90	508.10	507.80	507.70	507.90	507.90	508.70	508.50
25......	514.20	510.80	512.70	515.37	509.00	508.00	507.80	507.70	507.90	507.90	509.00	508.50
26......	512.90	510.50	513.00	518.05	509.30	508.00	507.90	507.70	507.80	508.00	509.90	508.50
27......	511.80	510.20	512.30	519.33	509.30	508.00	508.00	507.70	507.80	508.00	510.20	508.50
28......	511.30	511.40	511.40	519.70	509.20	508.00	508.00	507.70	508.00	508.10	509.90	508.50
29......	510.90	......	510.80	518.50	509.10	508.00	507.90	507.70	508.10	508.20	509.40	508.50
30......	509.90	......	510.40	516.60	508.90	508.00	507.90	507.70	508.10	508.30	510.40	508.90
31......	509.80	......	510.10	......	508.90	......	507.80	507.70	......	508.30	......	512.20

GENESEE RIVER AT ELMWOOD AVENUE, ROCHESTER, N. Y.

This station was established by Robert E. Horton, February 9, 1904, and was maintained by the United States Geological Survey in coöperation with this Department until May, 1907, when it was turned over to the Barge canal department. It is located at the Elmwood avenue bridge, in Rochester, N. Y.

The stream bed is of gravel and is clean and fairly permanent. The bridge consists of six spans of about 125 feet each. Conditions are favorable for the use of a current-meter.

Discharge measurements are made from the down-stream side of Elmwood avenue bridge. The initial point for soundings is the top of the face of the left abutment, down-stream side. A standard cypress staff gage is secured to the down-stream face of the first pier from the right-hand abutment of the bridge. The gage is sixteen feet long and is graduated decimally with galvanized-iron division marks.

Comparative Elevations.

	Rochester city datum.	Barge canal datum.
Zero, Elmwood avenue gage	245.591	506.848
Crest, Johnston and Seymour dam	241.91	503.16

Rating Table for Genesee River at Rochester, N. Y., for 1904–1910.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
1.00	400	3.70	5,080	6.40	12,600	9.10	21,760
1.10	490	3.80	5,320	6.50	12,900	9.20	22,120
1.20	580	3.90	5,560	6.60	13,220	9.30	22,480
1.30	670	4.00	5,800	6.70	13,540	9.40	22,840
1.40	760	4.10	6,060	6.80	13,860	9.50	23,200
1.50	850	4.20	6,320	6.90	14,180	9.60	23,580
1.60	1,000	4.30	6,580	7.00	14,500	9.70	23,960
1.70	1,150	4.40	6,840	7.10	14,820	9.80	24,340
1.80	1,300	4.50	7,100	7.20	15,140	9.90	24,720
1.90	1,450	4.60	7,380	7.30	15,460	10.00	25,100
2.00	1,600	4.70	7,660	7.40	15,780	10.10	25,480
2.10	1,780	4.80	7,940	7.50	16,100	10.20	25,860
2.20	1,960	4.90	8,220	7.60	16,440	10.30	26,240
2.30	2,140	5.00	8,500	7.70	16,780	10.40	26,620
2.40	2,320	5.10	8,780	7.80	17,120	10.50	27,000
2.50	2,500	5.20	9,060	7.90	17,460	10.60	27,400
2.60	2,700	5.30	9,340	8.00	17,800	10.70	27,800
2.70	2,900	5.40	9,620	8.10	18,160	10.80	28,200
2.80	3,100	5.50	9,900	8.20	18,520	10.90	28,600
2.90	3,300	5.60	10,200	8.30	18,880	11.00	29,000
3.00	3,500	5.70	10,500	8.40	19,240	11.10	29,400
3.10	3,610	5.80	10,800	8.50	19,600	11.20	29,800
3.20	3,940	5.90	11,100	8.60	19,960	11.30	30,200
3.30	4,160	6.00	11,400	8.70	20,320	11.40	30,600
3.40	4,380	6.10	11,700	8.80	20,680	11.50	31,000
3.50	4,600	6.20	12,000	8.90	21,040		
3.60	4,840	6.30	12,300	9.00	21,400		

The stream freezes over in winter at this Station. Measurements of discharge through ice have been made and a record of ice conditions is kept, but the data is insufficient for a satisfactory determination of discharge at certain times.

Current-meter Discharge Measurements of Genesee River at Elmwood Ave., Rochester, N. Y.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
1910.		*Feet.*	*Square feet.*	*Feet per second.*	*Feet.*	*Second-feet.*
Oct. 22	Hoyt and Shuttleworth	338	1,110	.332	1.07	369
Nov. 18	W. G. Hoyt	248	1,380	.96	1.85	1,320

Daily Discharge, Second-feet, of Genesee River at Elmwood Ave., Rochester, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	320	1,600	13,200	1,960	11,400	1,300	405	320	174	610	500	(2,640)
2	320	1,600	15,100	1,960	9,620	1,300	405	320	320	610	610	2,180
3	320	1,600	21,400	1,600	13,200	1,300	405	320	320	610	610	(1,970)
4	320	1,600	28,200	1,450	16,100	1,150	405	285	320	610	610	1,760
5	320	1,600	29,000	1,450	15,800	1,150	405	285	320	610	610	1,620
6	320	1,600	26,600	1,450	9,620	1,300	388	250	1,000	730	610	1,450
7	320	1,600	24,700	1,300	5,800	1,300	362	250	1,960	1,000	610	1,300
8	320	1,450	23,600	1,300	4,600	1,300	337	250	1,600	1,000	610	1,450
9	320	1,450	22,500	1,300	3,720	1,300	320	250	860	860	610	1,780
10	320	1,300	18,500	1,300	3,500	1,150	320	250	860	730	610	1,150
11	320	1,150	10,500	1,150	3,100	1,150	320	320	730	730	730	1,150
12	320	1,150	6,840	1,150	2,500	1,150	320	320	610	500	2,140	860
13	320	1,150	5,800	1,000	2,500	1,150	306	320	500	500	1,780	944
14	320	1,150	5,320	1,000	2,140	1,000	320	320	452	500	1,450	769
15	320	1,150	4,600	860	1,780	1,000	320	313	405	500	1,450	756
16	320	1,150	3,940	860	1,600	860	610	306	500	405	1,450	847
17	320	1,450	3,500	860	1,600	860	610	320	405	405	1,450	888
18	500	2,320	3,300	1,150	1,600	730	405	320	362	405	1,450	646
19	610	3,500	2,900	1,450	1,450	730	405	320	320	320	1,450	544
20	1,000	3,500	2,900	3,100	1,450	730	405	320	337	320	1,450	634
21	4,840	3,500	8,780	4,600	1,300	730	405	306	337	320	1,300	874
22	5,800	3,500	7,940	4,160	1,150	610	405	299	320	320	1,150	888
23	8,500	3,500	6,580	3,940	1,000	610	320	320	320	320	1,000	622
24	8,780	3,500	6,320	4,160	1,150	610	320	320	320	320	1,000	544
25	5,800	3,500	5,800	13,900	1,450	500	405	320	405	405	1,000	588
26	4,840	3,500	5,800	16,400	1,600	500	405	306	405	500	2,500	670
27	3,940	3,500	4,600	18,500	1,600	500	405	285	362	500	2,700	511
28	3,100	3,500	3,500	18,500	1,600	405	362	250	362	500	2,140	544
29	2,700	....	2,900	13,900	1,450	405	320	238	405	500	2,140	599
30	1,960	....	2,500	12,900	1,450	405	320	226	405	500	3,100	808
31	1,600	....	2,140	....	1,300	....	320	186	....	500	....	5,150

NOTE.— Daily discharge for open channel periods based on a well-defined rating. Discharge during the periods of ice conditions based on measurements made under ice cover and the discharge at other Genesee river stations.

Monthly Discharge of Genesee River at Elmwood Ave., Rochester, N. Y.

[Drainage area, 2,360 square miles. *a*]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
January	8,780	320	1,920	.814	0.94
February	3,500	1,150	2,180	.924	0.96
March	29,000	2,140	10,600	4.490	5.18
April	18,500	860	4,620	1.960	2.19
May	16,100	1,000	4,130	1.750	2.02
June	1,300	405	906	.384	0.43
July	610	320	379	.161	0.19
August	320	186	291	.123	0.14
September	1,960	174	533	.226	0.25
October	1,000	320	537	.22	0.26
November	3,100	500	1,290	.547	0.61
December	5,150	511	1,160	.492	0.57
The year	29,000	174	2,390	1.01	13.74

a U. S. Geological Survey figures; area heretofore used, 2,335 square miles.

GENESEE RIVER AT JONES BRIDGE, NEAR MT. MORRIS, N. Y.

This gaging station is at the highway bridge known as Jones bridge, crossing the Genesee river a short distance below the mouth of Canaseraga creek. It is located about 5 miles down-stream from Mt. Morris. The station was established May 22, 1903, by Robert E. Horton and was maintained by the U. S. Geological Survey in coöperation with this Department until April 30, 1906, when it was discontinued. It was reëstablished August 12, 1908, in coöperation with the State Water Supply Commission. The bed of the stream is clay and is smooth and fairly permanent. The stream flows in one channel during low water and overflows the adjacent flood plains at high stages. The current is sluggish in very low water.

Current-meter measurements are made from a foot bridge erected on the outriggers on the down-stream side of the bridge. The stream freezes over to some extent in winter and is at times obstructed by needle ice. The results of gagings for the years 1903 to 1906, inclusive, may be found in the State Engineer's report for 1905, pages 645 to 649, inclusive, and in the 1906 supplement, on pages 56 to 59, inclusive. The results here presented have been compiled from the reports of the State Water Supply Commission.

Mean Daily Gage Height, in Feet, of Genesee River at Jones bridge, near Mt. Morris, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1.....	4.50	7.10	8.15	9.25	25.85	4.93	4.17	3.01	3.45	3.45	3.80	4.00
2.....	4.45	7.00	7.70	9.80	26.25	4.90	4.07	3.51	3.40	3.60	3.80	4.00
3.....	4.35	7.40	9.25	9.80	23.20	4.80	4.07	3.51	3.40	3.35	3.80	3.90
4.....	4.35	7.65	8.85	8.60	17.95	4.70	3.92	3.36	3.40	3.55	3.70	3.90
5.....	.85	7.90	7.30	8.85	12.95	5.15	3.87	3.25	3.40	3.50	3.80	3.75
6.....	13.50	15.55	6.75	9.55	10.60	7.55	3.87	3.25	3.40	3.55	4.10	3.85
7.....	8.80	12.20	7.50	12.50	8.70	6.60	3.87	3.10	3.40	3.50	4.05	3.85
8.....	6.65	8.50	7.30	10.05	8.05	5.75	3.87	2.85	3.20	3.50	3.90	3.75
9.....	6.35	6.95	7.65	7.35	7.40	5.25	3.67	3.35	3.20	3.35	3.85	3.65
10.....	6.15	6.50	14.65	7.50	8.10	5.25	3.62	3.20	3.20	3.25	3.75	3.40
11.....	6.00	6.05	14.60	7.60	9.15	12.00	3.47	3.15	3.20	3.40	3.90	3.35
12.....	6.20	5.60	10.20	7.60	8.10	8.30	4.22	3.20	3.15	3.60	3.85	3.75
13.....	6.65	5.90	9.55	7.70	7.00	6.75	4.21	3.15	3.15	3.70	3.80	3.95
14.....	6.50	6.60	8.60	13.45	6.60	6.20	4.01	3.08	3.10	3.75	3.80	3.85
15.....	6.45	7.80	7.75	19.05	6.45	6.15	3.71	3.15	3.15	3.70	3.80	4.05
16.....	6.95	11.55	7.25	11.95	7.50	5.65	3.66	3.20	3.20	3.60	3.80	4.00
17.....,	7.00	11.90	6.80	9.85	7.75	5.30	3.71	3.30	3.30	3.40	3.80	4.00
18.....,	6.60	10.85	6.20	8.70	7.25	5.15	3.36	3.45	3.15	3.40	3.75	4.05
19.....	6.55	10.35	6.30	7.90	6.65	5.10	3.86	3.55	3.25	3.45	3.75	4.20
20.....	6.50	11.10	6.05	7.25	5.75	4.85	3.76	3.55	3.35	3.70	3.80	4.75
21.....	6.50	15.20	5.75	6.90	5.70	4.77	3.71	3.80	3.20	3.65	3.75	5.20
22.....	6.80	12.35	5.65	6.95	5.60	4.57	3.56	3.45	3.10	3.75	3.95	5.50
23.....	13.20	14.60	5.60	7.25	5.50	4.72	3.71	3.30	3.05	3.85	4.50	5.80
24.....	16.60	21.55	5.65	7.00	5.35	4.92	3.71	3.40	3.25	4.15	4.65	4.75
25.....	12.10	24.20	9.55	7.20	5.20	4.77	3.71	3.25	3.50	4.50	4.55	4.35
26.....	9.25	17.55	10.05	7.25	5.15	4.57	3.91	3.10	3.40	4.35	4.25	4.40
27.....	7.50	12.25	8.55	7.05	5.05	4.42	3.91	3.25	3.85	4.30	4.10	4.40
28.....	6.45	10.20	8.90	6.90	5.00	4.37	3.76	3.40	3.80	4.20	4.10	4.45
29.....	5.80	......	8.85	7.50	6.10	4.37	3.81	3.05	3.75	4.15	4.05	4.40
30.....	5.75	......	8.35	17.25	5.80	4.27	3.71	3.40	3.60	4.05	4.00	4.50
31.....	6.50	......	7.85	......	5.20	......	3.56	3.33	......	3.85	......	4.45

Mean Daily Gage Height, in Feet, of Genesee River at Jones bridge, near Mt. Morris, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	4.45	8.05	27.85	6.20	12.90	5.50	3.65	3.60	3.70	4.00	4.70	6.85
2.....	4.50	7.70	27.70	5.95	16.10	5.25	3.45	3.65	3.85	4.05	4.60	6.40
3.....	5.00	8.20	27.40	5.75	18.15	5.20	3.45	3.65	3.90	3.90	4.50	6.10
4.....	5.40	8.85	25.95	5.70	21.10	5.05	3.45	3.60	4.00	3.90	4.65	5.95
5.....	5.35	7.55	24.05	5.70	15.80	5.00	3.65	3.55	4.05	3.70	4.45	6.00
6.....	5.30	7.45	23.20	5.65	11.75	5.05	3.55	3.55	4.75	3.90	4.25	5.25
7.....	5.25	7.00	25.75	5.45	9.55	5.10	3.70	3.35	5.10	4.20	4.25	5.35
8.....	5.35	6.90	23.70	5.30	8.40	5.10	3.60	3.40	4.90	4.45	4.30	5.60
9.....	5.30	7.30	18.40	5.15	8.35	5.00	3.60	3.45	4.55	4.20	4.30	6.05
10.....	5.30	7.15	17.85	5.00	7.45	4.90	3.10	3.55	4.25	4.15	4.70	6.05
11.....	5.30	6.85	11.25	5.15	7.05	4.80	3.50	3.85	3.95	4.10	6.60	7.70
12.....	5.30	6.95	10.00	5.15	6.45	4.85	3.50	3.90	3.95	4.05	6.40	*a*7.70
13.....	5.30	6.90	9.40	5.05	6.25	4.80	3.65	3.60	4.00	4.00	5.70	*a*7.65
14.....	5.30	6.80	8.75	4.90	6.05	4.60	4.75	3.70	4.00	3.95	5.70	*a*7.40
15.....	5.30	6.80	8.35	4.80	5.75	4.50	4.70	3.45	3.75	3.70	5.70	*a*7.35
16.....	5.30	6.70	7.80	4.80	5.60	4.60	4.45	3.70	4.00	3.25	5.70	*a*7.10
17.....	5.25	7.20	7.50	4.90	5.50	4.55	4.20	3.45	4.00	3.45	5.70	*a*6.30
18.....	5.25	9.25	7.10	5.75	5.35	4.40	4.15	3.30	3.40	3.85	5.60	......
19.....	6.95	9.90	7.00	7.80	5.20	4.40	4.10	3.75	3.90	3.60	5.40	......
20.....	9.85	9.70	10.45	8.75	5.10	4.55	4.00	3.95	3.90	3.70	5.40	......
21.....	10.95	9.70	13.45	9.25	5.20	4.50	3.70	3.85	3.75	3.55	5.25	......
22.....	19.25	9.70	11.45	9.80	5.20	4.35	3.80	3.40	3.75	3.55	5.20	......
23.....	19.55	9.70	11.40	8.05	5.15	4.20	3.60	3.60	3.60	3.25	5.10	......
24.....	15.75	9.70	10.70	11.20	5.20	4.10	3.30	3.55	3.50	3.60	5.05	*a*6.40
25.....	12.55	9.70	10.95	22.25	5.55	3.90	3.60	3.55	3.20	3.90	6.85	......
26.....	11.15	9.50	10.25	24.65	5.65	3.80	......	3.75	3.80	4.05	7.35	......
27.....	10.45	8.55	8.75	24.45	5.55	3.90	......	3.60	3.90	4.50	6.55	......
28.....	9.75	15.45	7.85	18.50	5.35	3.95	3.80	3.60	4.50	4.40	6.00	......
29.....	8.90	......	7.15	13.40	5.15	3.95	3.60	3.20	4.25	4.60	7.25	......
30.....	8.50	......	6.70	17.65	5.10	3.85	3.65	3.60	4.20	4.80	7.70	*a*13.00
31.....	8.25	......	6.35	......	5.15	......	3.10	3.80	......	4.70	......	......

a Gage height to top of ice.

Current-meter Discharge Measurements of Genesee River at Jones bridge, near Mt. Morris, N. Y

DATE.	Hydrographer.	Mean gage reading.	Lateral interval.	Total area.	Corrected discharge.
1910.			*Feet.*	*Square feet.*	*Second-feet.*
April 20..	C. C. Covert......................	9.38	153	852	3,700
April 21..	C. C. Covert......................	8.70	145	677	2,770
July 20..	W. G. Hoyt........................	4.08	75	205	323
Aug. 22..	C. C. Covert......................	3.35	48	45.6	103
Oct. 25..	W. G. Hoyt........................	3.96	70	193	244
Nov. 18..	W. G. Hoyt........................	3.58	91	333	968

Mean Daily Discharge, Second-feet, of Genesee River at Jones bridge, near Mt. Morris, N. Y.

DAY.	Jan.	Feb.	Mar.	Apr'l.	May.	June.	July.	Aug.	Sept.	Oct.	**Nov.**	**Dec.**
1909.												
1	490	1,100	2,500	3,220	16,200	688	360	46	138	138	**235**	**300**
2	470	800	2,210	3,610	16,600	665	324	152	125	175	**235**	**300**
3	430	800	3,220	3,610	14,100	620	324	152	125	112	**235**	**265**
4	430	800	2,950	2,790	9,920	575	272	115	125	162	**205**	**265**
5	1,150	2,340	1,970	2,950	5,920	785	256	90	125	150	**235**	**220**
6	6,360	8,000	1,640	3,440	4,170	2,120	256	90	125	162	**335**	**250**
7	2,920	5,320	2,090	5,560	2,860	1,560	256	60	125	150	**318**	**250**
8	1,590	2,720	1,970	3,780	2,430	1,090	256	30	80	150	**265**	**220**
9	1,420	1,760	2,180	2,000	2,030	835	196	112	80	112	**250**	**190**
10	1,310	1,500	7,280	2,090	2,460	835	181	80	80	90	**220**	**125**
11	1,230	1,260	7,240	2,150	3,160	5,170	142	70	80	125	**265**	**112**
12	1,340	1,010	3,890	2,150	2,460	2,600	378	80	70	175	**250**	**220**
13	1,590	1,180	3,440	2,210	1,790	1,640	374	70	70	205	**235**	**282**
14	1,500	1,560	2,790	6,320	1,560	1,340	304	57	60	220	**235**	**250**
15	1,480	2,270	2,240	10,800	1,480	1,310	208	70	70	205	**235**	**318**
16	1,760	4,000	1,940	5,130	2,090	1,040	193	80	80	175	**235**	**300**
17	1,790	1,280	1,670	3,640	2,240	860	208	100	100	125	**235**	**300**
18	1,560	1,200	1,340	2,860	1,940	785	115	138	70	125	**220**	**280**
19	1,530	1,200	1,400	2,340	1,590	760	253	162	90	138	**220**	**280**
20	1,500	4,520	1,260	1,940	1,090	642	223	162	112	205	**235**	**280**
21	1,500	7,720	1,090	1,730	1,060	606	208	235	80	190	**220**	**280**
22	1,670	5,440	1,040	1,760	1,010	518	165	138	60	220	**282**	**280**
23	6,120	7,240	1,010	1,940	960	584	208	100	52	250	**490**	**280**
24	8,840	12,800	1,040	1,790	885	674	208	125	90	352	**552**	**280**
25	5,240	14,900	3,440	1,910	810	606	208	90	150	490	**510**	**280**
26	3,220	9,600	3,780	1,940	785	518	268	60	125	430	**390**	**280**
27	2,090	5,360	2,760	1,820	735	458	268	90	250	410	**335**	**280**
28	1,480	3,890	2,980	1,730	710	438	223	125	235	370	**335**	**280**
29	1,120	......	2,950	2,090	1,280	438	238	52	220	352	**318**	**280**
30	1,090	......	2,630	9,360	1,120	398	208	125	175	318	**300**	**280**
31	1,500	......	2,300	......	810	......	165	108	......	250	......	**280**

Mean Daily Discharge, Second-feet, of Genesee River at Jones bridge, near Mt. Morris, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	**Dec.**
1910.												
1	250	1,400	17,800	1,340	5,880	960	190	175	205	300	575	**1,700**
2	250	1,300	17,700	1,200	8,440	835	138	190	250	318	530	**1,450**
3	250	1,200	17,500	1,090	10,100	810	138	190	265	265	490	**1,280**
4	250	1,000	16,300	1,060	12,400	735	138	175	300	265	552	**1,200**
5	250	1,000	14,800	1,060	8,200	710	190	162	318	205	470	**1,230**
6	250	900	14,100	1,040	4,980	735	162	162	598	265	390	**835**
7	250	800	16,200	935	3,440	760	205	112	760	370	390	**800**
8	250	800	14,500	860	2,600	700	175	125	665	470	410	**800**
9	250	800	10,300	785	2,630	710	175	138	510	370	410	**800**
10	250	800	9,840	710	2,060	66	60	162	390	352	575	**800**
11	250	800	4,620	785	1,820	620	150	250	282	335	1,560	**800**
12	250	800	3,750	785	1,480	642	150	265	282	318	1,450	**800**
13	250	1,600	3,330	735	1,370	620	190	175	300	300	1,060	**700**
14	250	2,000	2,890	665	1,260	530	508	205	300	282	1,060	**600**
15	250	2,400	2,630	620	1,050	490	575	138	220	205	1,060	**600**
16	250	2,500	2,270	620	1,010	530	470	205	300	90	1,060	**600**
17	250	2,600	2,090	665	960	510	370	138	360	138	1,060	**600**
18	250	2,600	1,850	1,090	885	450	352	109	125	250	1,010	**600**
19	1,140	2,300	1,790	2,270	810	450	335	220	265	175	910	**650**
20	2,400	2,100	4,060	2,890	760	510	300	282	265	205	910	**650**
21	4,000	2,100	6,320	3,220	810	490	205	250	220	162	835	**650**
22	9,600	2,100	4,760	3,610	810	430	235	125	220	162	810	**600**
23	5,200	2,100	4,730	2,430	785	370	175	175	175	90	760	**500**
24	4,900	2,100	4,240	4,590	810	335	100	162	150	175	735	**500**
25	4,100	2,100	4,420	13,400	985	265	175	162	80	265	1,700	**500**
26	3,300	2,100	3,920	15,300	1,040	235	195	220	235	318	2,000	**500**
27	2,600	3,200	2,890	15,100	985	265	215	175	265	490	1,530	**500**
28	2,200	3,700	2,300	10,400	885	282	235	175	490	450	1,230	**600**
29	2,100	......	1,880	6,280	785	282	175	80	390	530	1,940	**700**
30	1,900	......	1,620	9,680	760	250	190	175	370	620	2,210	**5,000**
31	1,700	......	1,420	......	785	......	60	235	......	575	......	**13,000**

Monthly Discharge of Genesee River at Jones bridge, near Mt. Morris, N. Y.
[Drainage area, 1,410 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1908.					
August	1,010	220	467	.331	.26
September	250	52	171	.121	.14
October	190	40	151	.107	.12
November	352	60	216	.153	.17
December	....	....	(230)	.163	.19
1909.					
January	8,840	430	(2,120)	1.50	1.73
February	14,900	800	(3,980)	2.82	2.94
March	7,280	1,010	2,590	1.84	2.12
April	10,800	1,730	3,290	2.33	2.60
May	16,600	710	3,430	2.43	2.80
June	5,170	398	1,040	.738	.82
July	378	115	240	.170	.20
August	235	30	102	.072	.08
September	250	52	112	.079	.09
October	490	90	217	.154	.18
November	552	205	288	.204	.23
December	318	112	(261)	.185	.21
1910.					
January	....	....	1,600	1.13	1.30
February	....	....	1,760	1.25	1.30
March	17,800	1,420	6,690	4.96	5.72
April	15,300	620	3,510	2.49	2.78
May	12,400	760	2,630	1.86	2.14
June	960	235	541	.384	.43
July	598	60	226	.160	.18
August	282	80	178	.126	.15
September	760	80	316	.224	.25
October	620	90	300	.213	.25
November	2,210	390	989	.701	.78
December	....	....	1,280	.908	1.05

GENESEE RIVER AT ST. HELENA, N. Y.

This gaging station is located at the steel highway bridge crossing Genesee river about 6 miles down-stream from the lower falls at Portage and about 5½ miles down-stream from Portageville. It was established August 14, 1908, by the U. S. Geological Survey in coöperation with the State Water Supply Commission. The bed of the stream is coarse gravel and is permanent. Conditions for obtaining current-meter measurements are good and a fairly complete and generally consistent discharge curve is obtained.

The gage is read by Herman Piper, and although the stream is somewhat obstructed by needle ice at times, the general ice conditions are not such as to materially impair the accuracy of results deduced from the open-water rating curve, which is used throughout the year. The results here presented are compiled from the records of the State Water Supply Commission.

Current-meter Discharge Measurements of Genesee River at St. Helena, N. Y.

DATE.	Hydrographer.	Mean gage reading.	Total area.	Total width.	Corrected discharge.
			Square feet.	*Feet.*	*Second-feet.*
1908.					
Aug. 14....	Brett and Allen..................	2.42	260	142	311
Sept. 11....	C. R. Adams..................	1.90	193	120	132
Oct. 19....	C. R. Adams..................	1.83	164	104	89.2
1909.					
Jan. 25 *a*...	C. R. Adams..................	5.28	1,070	....	3,900
Feb. 16 *b*...	C. R. Adams..................	3.98	495	175	1,660
April 22....	C. C. Covert..................	3.74	587	299	1,370
May 1....	E. F. Weeks..................	9.75	2,410	329	22,300
May 2....	E. F. Weeks..................	8.40	2,000	315	14,800
May 2....	E. F. Weeks..................	7.72	1,800	309	11,900
May 3....	E. F. Weeks..................	6.35	1,360	305	7,160
May 3....	E. F. Weeks..................	5.96	1,260	302	5,800
May 4....	E. F. Weeks..................	5.60	1,120	306	4,780
May 4....	E. F. Weeks..................	5.42	1,090	311	4,520
May 5....	E. F. Weeks..................	5.02	975	310	3,940
Aug. 13 *c*...	C. C. Covert..................	1.60	93	107	72
Aug. 14 *c*...	C. C. Covert..................	1.52	83	104	57
Dec. 10 *d*...	C. C. Covert..................	2.35	221	103	182

a No ice at station; very little above or below.
b Anchor ice running in large quantities, and clogging meter. Discharge not much affected.
c Measurement made at wading section.
d Partial ice conditions; broken ice .05 foot thick.

Discharge measurements of Genesee River at St. Helena, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1910.						
April 21...	C. C. Covert..........	4.92	296	889	3.80	3,380
July 19...	W. G. Hoyt..........	2.06	103	203	1.11	226
Aug. 26...	C. C. Covert..........	1.92	102	168	.946	159
Oct. 24 *a*..	W. G. Hoyt..........	2.14	133	150	1.43	214
Nov. 17...	W. G. Hoyt..........	3.24	176	392	2.58	1,010
Dec. 9 *b*..	W. G. Hoyt..........	2.85	194	298	2.16	465

a Measurement made at wading section above bridge.
b Measurement made under partial ice cover; slush ice running in considerable amounts.

Mean Daily Discharge, Second-feet, of Genesee River at St. Helena, N. Y.

DAY.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.					
1	......	152	152	122	137
2	......	152	152	108	137
3	......	152	122	117	128
4	......	122	122	128	159
5	......	152	122	100	146
6	......	152	122	108	192
7	......	152	122	117	122
8	......	122	95	122	137
9	......	95	108	100	152
10	......	62	95	128	203
11	......	122	122	62	192
12	......	122	108	203	159
13	......	95	108	192	168
14	303	95	108	214	146
15	369	108	128	159	168
16	325	95	122	159	178
17	420	122	128	241	221
18	640	95	117	192	203
19	470	82	117	178	241
20	325	95	100	214	282
21	282	82	100	229	253
22	282	82	100	203	229
23	241	95	100	203	325
24	241	95	95	192	282
25	203	95	100	203	241
26	203	82	95	178	253
27	203	71	100	152	261
28	203	71	122	159	261
29	168	122	100	159	253
30	168	122	122	159	241
31	152	......	117	......	295
Mean	289	109	114	160	205

Mean Daily Discharge, Second-feet, of Genesee River at St. Helena, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1	325	448	2,300	2,930	19,400	270	233	104	80	113	185	198
2	295	506	1,510	2,740	13,900	371	198	68	85	127	166	166
3	295	556	2,840	2,300	6,680	357	198	80	92	80	185	176
4	325	477	1,960	2,210	4,750	371	191	80	85	85	154	160
5	2,470	672	1,250	2,560	3,520	568	185	92	80	98	219	146
6	7,120	7,720	1,250	3,670	2,560	1,960	176	108	64	64	233	154
7	2,040	3,670	1,660	2,650	2,040	970	154	80	85	74	219	154
8	750	1,880	1,440	3,130	1,660	635	160	80	68	92	233	166
9	672	1,020	1,440	2,120	1,380	494	154	74	74	104	198	80
10	750	1,020	7,570	1,960	1,470	970	138	146	74	74	176	180
11	710	790	4,580	1,660	2,560	4,230	166	71	68	71	191	180
12	602	602	2,380	1,880	1,660	1,730	233	68	74	113	176	180
13	506	807	2,740	1,880	1,170	1,050	185	64	68	108	154	180
14	537	750	2,120	10,200	922	894	154	64	74	127	160	180
15	635	2,740	1,730	5,450	1,020	807	132	59	68	154	163	180
16	672	1,730	1,510	3,450	2,300	672	138	98	80	166	166	180
17	602	1,190	1,020	2,560	1,340	537	154	104	85	98	138	180
18	537	1,080	832	1,960	1,020	518	113	92	80	154	138	180
19	477	875	1,020	1,510	875	537	160	85	74	120	138	180
20	477	6,260	1,080	1,250	766	422	127	98	80	138	166	180
21	506	4,340	832	1,510	695	338	127	92	74	127	166	180
22	602	3,130	807	1,380	650	357	127	68	80	166	371	180
23	2,840	4,940	672	1,080	581	460	154	80	68	198	347	80
24	7,120	10,400	635	1,020	537	477	166	68	113	303	437	180
25	4,940	6,260	3,890	750	518	406	198	59	98	295	338	180
26	2,380	4,000	2,470	832	422	338	166	64	166	282	270	180
27	1,440	3,090	1,880	875	448	270	154	88	166	270	233	180
28	922	2,300	2,300	1,510	371	270	113	80	138	295	176	180
29	695	......	2,520	1,440	922	244	146	104	104	255	219	180
30	710	......	2,120	18,000	650	255	104	98	120	219	198	180
31	556	......	1,800	......	537	......	104	85	......	166	......	180

Discharge, December 10 to 31, 1909, based on an ice measurement made December 10, 1909' this period is only approximate.

Mean Daily discharge, Second-feet, of Genesee River at St. Helena, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	180	672	19,500	1,070	3,390	672	187	121	140	226	470	1,290
2......	180	568	17,000	919	8,340	614	148	154	226	191	420	1,290
3......	190	756	14,000	783	7,880	638	98	148	226	169	391	1,170
4......	200	568	9,730	894	8,180	560	109	132	239	211	482	1,130
5......	200	614	8,250	868	4,360	591	169	132	211	178	308	1,060
6......	200	517	9,580	783	3,030	575	169	121	432	191	260	868
7......	200	482	20,300	698	2,210	575	114	73	672	284	319	783
8......	200	614	6,740	614	1,780	538	114	73	552	351	308	715
9......	200	591	4,750	664	1,560	517	157	126	374	284	319	647
10......	200	538	3,290	583	1,440	489	157	169	298	252	800	647
11......	200	496	2,840	560	1,240	489	157	239	226	239	1,780	732
12......	200	391	2,710	470	1,100	517	140	191	201	191	1,220	672
13......	200	2,210	3,230	445	988	451	284	102	239	80	1,240	538
14......	200	1,910	2,270	408	868	391	565	102	226	114	988	568
15......	200	1,740	1,870	426	783	335	408	154	169	184	1,080	517
16......	200	1,700	1,740	445	698	426	298	169	211	114	1,020	470
17......	200	2,570	1,540	510	698	451	284	84	160	169	1,040	517
18......	400	1,940	1,310	1,190	614	391	239	107	91	169	928	538
19......	2,450	1,540	1,520	2,390	672	368	198	201	160	148	885	614
20......	2,210	1,330	4,840	3,110	538	335	391	191	160	169	800	614
21......	2,130	1,360	5,220	3,250	591	313	126	102	148	218	732	517
22......	8,600	1,310	3,980	2,800	496	298	107	154	132	148	647	408
23......	4,580	1,610	4,260	1,710	517	284	107	126	114	132	732	470
24......	2,990	1,260	4,110	7,720	698	239	91	148	140	218	800	451
25......	2,540	1,500	4,260	14,900	732	194	184	77	169	201	1,950	482
26......	1,580	2,300	3,110	19,700	868	201	191	160	160	252	1,950	432
27......	1,520	5,400	2,260	8,600	758	222	102	91	591	391	1,400	470
28......	1,220	11,700	1,810	4,580	647	187	148	69	408	408	1,130	496
29......	1,020	......	1,590	5,580	538	178	154	126	335	568	1,150	614
30......	902	......	1,200	6,260	614	169	132	98	284	432	1,980	12,100
31......	817	......	1,190	......	758	......	91	126	......	496	......	3,700

NOTE.— From January 1 to 18 the estimates of discharge are based upon a discharge measurement made in December, 1909, and upon general ice conditions.
February 25 to 28, daily discharge corrected for ice jam.

Monthly Discharge of Genesee River at St. Helena, N. Y.
[Drainage area, 1,030 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1908.					
August 14–31	672	160	294	0.285	0.19
September	160	80	121	.117	.13
October	160	108	125	.121	.14
November	244	80	168	.163	.18
December	....	....	160	.155	.18
1909.					
January	7,120	295	1,400	1.36	1.57
February	10,400	448	2,620	2.54	2.64
March	7,570	635	2,010	1.95	2.25
April	18,000	750	2,880	2.80	3.12
May	19,400	371	2,490	2.42	2.79
June	4,230	244	726	.705	.79
July	233	104	158	.153	.18
August	146	59	83.9	.082	.09
September	166	64	88.8	.086	.10
October	303	64	153	.149	.17
November	437	138	210	.204	.23
December	....	80	(173)	.168	.19
The year	19,400	59	1,080	1.05	14.12

Note.— The monthly discharge table for 1908 supersedes the estimates given in the fourth annual report of the State Water Supply Commission. It is based on new data recently available. The monthly discharge for December, 1908, is based on the discharge at Mt. Morris, N. Y.

Monthly Discharge of Genesee River at St. Helena, N. Y.—(Continued).

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
January	....	....	1,170	1.14	1.31
February	11,700	391	1,720	1.67	1.74
March	20,300	1,190	5,480	5.32	6.13
April	19,700	408	3,100	3.01	3.36
May	8,340	496	1,860	1.81	2.09
June	672	169	407	.395	.44
July	656	91	191	.185	.21
August	239	69	131	.127	.15
September	672	91	256	.249	.28
October	568	80	238	.231	.27
November	1,980	260	918	.891	.99
December	12,100	408	1,150	1.12	1.29
The year	20,300	69	1,380	1.35	18.26

CANASERAGA CREEK DRAINAGE BASIN

DESCRIPTION.

Canaseraga creek, one of the most important tributaries to the Genesee river from the east, rises in the extreme northwestern corner of Steuben county and flows in a northwestern direction to its junction with the Genesee river, a short distance below the village of Mt. Morris.

Through its entire course, the creek flows through a flat, fertile valley, devoted almost entirely to the pursuit of agriculture. From the village of Dansville to Mt. Morris, a distance of 22½ miles, the river winds back and forth across the valley. The velocity is so slow that the large amount of silt which is brought down from the foot hills by the smaller streams is deposited in the creek bed, raising it to an elevation higher, in many cases, than the surrounding country. The deposit of silt, coupled with the extreme deviation of the creek from a straight line, causes the 11,000 acres, which border on the stream below Dansville, to become annually inundated by the flood waters.

CANASERAGA CREEK AT DANSVILLE, N. Y.

This station is located at the highway bridge one mile due west from the village of Dansville and about 22 miles above the mouth of the stream.

It was established July 21, 1910, by the N. Y. State Water Supply Commission, in coöperation with the U. S. Geological

Survey, to obtain data in regard to the flow of this stream and to aid in a general way the studies being made of the flow of the Genesee river.

The data here presented have been compiled from the reports of the State Water Supply Commission.

A staff gage is bolted to the down-stream, left-hand wing wall and is read twice daily. Low-water measurements are made by wading below the bridge and high-water measurements will be made from the bridge. The bed of the stream at this point is composed of sand and gravel and may shift during high water.

The rating curve is not yet sufficiently developed to warrant publishing the discharge, so only discharge measurements and gage heights are published.

Current-meter Discharge Measurements of Canaseraga Creek at Dansville, N.Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
1910.		*Feet.*	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
July 21 *a*...	W. G. Hoyt..........	1.75	42	22.7	1.25	27.3
Aug. 21 *a*...	C. C. Covert..........	1.72	43	29.6	1.22	36.0
Oct. 26 *a*...	F. J. Shuttleworth.....	1.80	44	22.6	1.36	30.7

a Measurement made at wading section.

Mean Daily Gage Height, in Feet, of Canaseraga Creek at Dansville, N. Y.
[Floyd Harter, observer.]

DAY.	July.	Aug.	Sept.	Oct.	Nov.	Dec
1910.						
1	......	1.75	1.82	1.75	1.78	1.92
2	......	1.75	1.75	1.70	1.80	1.98
3	......	1.78	1.88	1.70	1.75	2.08
4	......	1.78	1.80	1.68	1.80	2.02
5	......	1.75	1.75	1.68	1.80	2.00
6	......	1.75	1.85	1.75	1.80	1.92
7	......	1.78	1.78	1.95	1.78	1.90
8	......	1.75	1.75	1.78	1.78	1.82
9	......	1.75	1.78	1.75	1.90	1.88
10	......	1.92	1.75	1.75	2.02	1.85
11	......	1.82	1.72	1.72	2.15	......
12	......	1.75	1.72	1.75	1.92	......
13	......	1.75	1.72	1.72	1.80	......
14	......	1.75	1.75	1.70	1.82	......
15	......	1.72	1.72	1.72	1.80	......
16	......	1.72	1.72	1.70	1.85	......
17	......	1.75	1.75	1.72	1.82	......
18	......	1.78	1.75	1.72	1.82	......
19	......	1.85	1.78	1.68	1.92	......
20	......	1.78	1.75	1.68	1.88	......
21	1.75	1.75	1.72	1.72	1.82	......
22	1.72	1.75	1.72	1.75	1.80	......
23	1.75	1.72	1.72	1.72	1.85	......
24	1.78	1.70	1.85	1.75	1.80	......
25	1.75	1.72	1.78	1.88	2.08	......
26	1.75	1.82	1.75	1.82	2.02	......
27	1.75	1.75	1.75	1.82	1.95	......
28	1.80	1.75	1.72	1.80	2.05	......
29	1.75	1.72	1.72	1.82	2.00	......
30	1.85	1.72	1.75	1.80	1.92	......
31	1.75	1.72	......	1.82	......	......

NOTE.— Ice conditions prevailed December 10-31. No gage heights for this period.

CANASERAGA CREEK AT SHAKERS' CROSSING, N. Y.

Measurements have been made from the highway bridge at Shakers' Crossing, about one-half mile above the junction of Canaseraga creek with Genesee river.

Owing to the fact that during any flood period the water is backed up from the Genesee river, no gage has been installed at this place, but measurements have been referred to a reference point and are here published under one head.

The reference point to which these measurements have been referred is the top of the horizontal tie-bar 20 feet from the left-hand abutment, down-stream side of bridge.

The data here presented have been compiled from the reports of the N. Y. State Water Supply Commission.

Current-meter Discharge Measurements of Canaseraga Creek at Shakers' Crossing, near Mt. Morris, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1904.						
April 12...	R. E. Horton.........	7.58	....	....	....	1,050
July 16...	C. C. Covert..........	3.8	....	....	....	242
1905.						
Mar. 24 *b*..	C. C. Covert..........	18.88	100	1,450	1.47	2,010
Mar. 30...	C. C. Covert..........	12.32	100	772	3.72	2,880
Mar. 31...	C. C. Covert..........	9.88	90	546	3.87	2,120
April 1...	C. C. Covert..........	7.88	82	374	3.86	1,440
Aug. 25...	C. C. Covert..........	3.72	60	92	2.73	252
1906.						
Mar. 29...	C. C. Covert..........	9.22	84	500	3.76	1,880
Mar. 30...	C. C. Covert..........	8.90	84	456	3.75	1,620
Mar. 31 *b*..	C. C. Covert..........	13.55	94	900	1.86	1,670
April 2...	C. C. Covert..........	7.85	81	368	3.89	1,430
April 3...	C. C. Covert..........	7.00	75	310	3.71	1,150
April 21...	C. C. Covert..........	4.45	66	142	3.37	478
1910.						
April 20...	C. C. Covert..........	6.29	86	278	....	594
July 20...	W. G. Hoyt..........	3.90	66	126	....	270
Aug. 22 *c*..	C. C. Covert..........	2.52	34	16.9	....	36.6
Oct. 26...	F. J. Shuttleworth.....	3.84	63	135	....	260

a Gage datum is 25 feet below reference point on horizontal tie-bar 20 feet from left-hand end down-stream side of bridge.

b Backwater from Genesee river.

c Made by wading below bridge.

KESHEQUA CREEK DRAINAGE BASIN.

DESCRIPTION.

Keshequa creek, the principal tributary to Canaseraga creek, has its source among the hills of northern Allegany county and flows north and northeast through Nunda and Tuscarora joining Canaseraga creek near Sonyea, the home of the Craig Colony for Epileptics. Throughout its length of some 20 miles it flows through a narrow valley and falls about 1,200 feet. No power is developed, as the flow during the summer averages only 3 to 6 second-feet. The yearly rain fall is a little above the average for the Genesee valley and ranges from 28 to 36 inches.

KESHEQUA CREEK AT SONYEA, N. Y.

This station is located at the upper highway bridge in the village and about two miles above the mouth of the stream. It was installed to aid in the studies of the flow of Canaseraga creek and to obtain data in regard to the run-off of small drainage areas in the western part of the state.

A staff gage was installed July 22, 1910 by the N. Y. State Water Supply Commission, in coöperation with the U. S. Geological Survey. This gage is fastened to a pile, located on the right-hand bank between the two bridges, directly back and across from the Craig Colony power house. This gage is intended only for the low-water periods of the year, as on October 25 a chain gage was installed on the up-stream side of the upper bridge. Discharge measurements are made by wading. Either bridge may be used during high water.

The bed of the creek is composed of gravel and sand and the channel shifts back and forth from year to year. The rating curve is not developed as yet and only gage heights and discharge measurements are published.

The data here presented have been compiled from reports of the N. Y. State Water Supply Commission.

Current-meter Discharge Measurements at Keshequa Creek at Sonyea, N. Y.

DATE.	Hydrographer.	Gage height.*	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1910.						
July 22 *a*	W. C. Hoyt	0.55	18	6.16	.424	2.61
Aug. 26 *a*	C. C. Covert	0.52	8.6	2.6	.75	1.96
Oct. 25 *a*	W. C. Hoyt	*b* 0.61	22	8.6	.58	4.99

* Staff gage.

a Measurement made at wading section.

b Chain gage read 3.46.

Mean Daily Gage Height, in Feet, of Keshequa Creek at Sonyea, N. Y.

[Elmer E. Reynolds, observer.]

DAY.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.						
1	......	.55	.65	.55	.65	.95
2	......	.62	.60	.55	.65	.85
3	......	.58	.65	.55	.70	.80
4	......	.55	.65	.55	.68	.75
5	......	.55	.68	.55	.65	.80
6	......	.58	.68	.62	.65	.80
7	......	.55	.65	.80	.65	.80
8	......	.55	.68	.80	.70	.80
9	......	.58	.68	.75	.70	.80
10	......	.62	.60	.68	.80	......
11	......	.72	.60	.65	.85	......
12	......	.65	.60	.65	.80	......
13	......	.62	.62	.65	.80	......
14	......	.58	.62	.60	.78	......
15	......	.55	.60	.55	.80	......
16	......	.55	.60	.55	.78	......
17	......	.60	.60	.55	.75	......
18	......	.62	.60	.55	.75	......
19	......	.75	.60	.55	.75	......
20	......	.70	.62	.55	.70	......
21	......	.62	.65	.55	.75	......
22	.55	.60	.65	.58	.75	......
23	.58	.60	.65	.60	.70	......
24	.55	.60	.60	.60	.70	......
25	.55	.60	.60	60	.82	......
26	.58	.58	.60	.60	.85	......
27	.55	.65	.60	.60	.82	......
28	.55	.60	.55	.65	.80	......
29	.55	.60	.55	.65	.88	......
30	.55	.58	.55	.65	.88	......
31	.55	.60	....	.65	......	......

NOTE.— Reading discontinued December 9, on account of ice conditions.

CANADICE LAKE.

DESCRIPTION.

Canadice lake is tributary to Genesee river through Hemlock lake outlet and Honeoye creek. The area drained by the lake forms an irregular rectangle, the lake lying somewhat to the left of the longitudinal axis and the greater portion of the drainage being on the eastern slope. The western slope is narrow and precipitous. Bald Hill rises from an altitude of 1,090 feet at the lake to 1,800 feet at the summit and has its axis parallel to the lake at an average distance of three-fourths of a mile from it. The lake has a water-surface area of 0.7 square mile and drains a total area of 12.6 square miles, 5.6 per cent of which is lake surface.

CANADICE LAKE OUTLET NEAR HEMLOCK, N. Y.

A weir was constructed at the outlet at the foot of the lake by the city engineer's department of Rochester, N. Y., in February, 1903. The entire yield of the drainage basin passes this weir.

A standard thin-edged weir, with a five-foot crest and two end contractions, is so arranged with needle-timbers at the ends that during high water the length may be increased to 14.96 feet with no end contractions. The weir crest stands three feet above the stream channel and is never submerged by backwater. There are two additional rectangular gates each one foot square, with three complete contractions and a fourth partial contraction at the bottom. The outflow from the lake above the weir is controlled by gates.

A reading of the depth of the weir is taken each morning, and also for each change of the gates, the depth being read to hundredths and corrections being made for velocity of approach for the larger discharges. The discharge is calculated by the Francis formula. The record has been furnished by E. A. Fisher, city engineer, and John F. Skinner, principal assistant city engineer, of Rochester, N. Y.

Monthly Discharge of Canadice Lake near Hemlock, N. Y.

[Drainage area, 12.6 square miles.]

MONTH.	Mean elevation of lake above low water.	DISCHARGE IN SECOND-FEET.		RUN-OFF.
		Mean.	Per square mile.	Depth in inches on drainage area.
1908.	*Feet.*			
January	2.042	26.4	2.095	2.409
February	1.658	23.2	1.841	1.988
March	2.143	33.6	2.667	3.067
April	2.146	16.5	1.310	1.467
May	1.893	32.0	2.540	2.921
June	2.479	10.2	0.810	0.907
July	2.213	11.2	0.889	1.022
August	1.448	8.6	0.683	0.785
September	0.718	4.3	0.341	0.382
October	0.155	2.9	0.230	0.264
November	—0.345	4.0	0.317	0.355
December	—0.841	3.7	0.294	0.338
The year	1.309	14.7	1.167	....
1909.				
January	—0.777	3.3	0.262	0.301
February	0.154	5.7	0.452	0.470
March	1.501	16.0	1.270	1.460
April	2.096	28.0	2.222	2.489
May	2.420	20.0	1.587	1.825
June	1.770	8.6	0.683	0.765
July	0.972	5.8	0.460	0.529
August	0.409	3.3	0.262	0.301
September	—0.179	4.8	0.381	0.427
October	—0.682	4.5	0.357	0.410
*November	—1.090	4.5	0.357	0.400
December	—1.434	3.2	0.254	0.292
The year	....	8.9	0.706	....
1910.				
January	—1.409	3.7	0.294	0.338
February	—0.768	4.1	0.325	0.338
March	1.929	23.0	0.825	2.100
April	2.054	11.0	0.873	0.978
May	2.800	24.2	1.921	2.209
June	2.473	5.7	0.452	0.506
July	1.904	4.6	0.365	0.420
August	1.481	4.3	0.341	0.392
September	1.330	5.0	0.397	0.445
October	0.927	4.8	0.381	0.438
November	0.539	5.9	0.468	0.524
December	0.523	5.8	0.460	0.529
The year	1.148	8.5	0.675	....

* Fifteen days.

NIAGARA RIVER DRAINAGE.

GENERAL FEATURES.

Niagara river connects lakes Erie and Ontario. It receives the drainage from Tonawanda creek and adjacent smaller areas in New York.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Erie Canal at Tonawanda, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	*b*	570.40	572.73	571.20	*a*	571.60	571.20	571.70	571.00	571.30	571.80	571.90
2......	*a*	570.10	573.20	571.20	572.00	571.50	571.20	572.20	571.00	*a*	571.90	571.70
3......	570.80	570.00	573.53	*a*	572.90	571.20	571.20	571.70	571.20	571.00	571.60	571.60
4......	570.70	570.50	573.67	571.10	573.00	571.10	571.20	571.40	*a*	571.00	571.20	*a*
5......	570.90	570.00	573.70	571.10	572.40	*a*	571.00	571.50	*b*	571.10	571.30	571.40
6......	571.40	*a*	*a*	571.20	572.30	571.40	571.00	571.60	571.90	571.20	*a*	571.10
7......	571.60	570.00	573.80	571.20	571.40	571.30	571.00	*a*	572.00	571.50	571.70	571.30
8......	571.50	570.10	573.25	571.10	*a*	571.60	571.30	571.40	571.80	571.80	571.50	571.30
9......	*a*	570.10	572.60	571.10	571.10	571.60	571.30	571.40	572.20	*a*	571.30	571.30
10......	571.30	570.00	572.40	*a*	571.00	571.30	*a*	571.20	572.30	571.60	571.40	571.10
11......	571.10	570.10	571.50	571.10	571.70	571.30	571.20	571.30	*a*	571.80	572.20	*a*
12......	571.30	570.10	571.10	571.10	571.70	*a*	571.30	571.30	571.40	571.40	572.10	571.10
13......	570.80	*a*	*a*	571.10	571.70	571.60	571.40	571.30	571.70	571.20	*a*	571.10
14......	571.00	570.00	570.70	571.10	571.50	571.50	571.40	*a*	571.60	571.20	571.40	571.20
15......	570.60	570.00	570.70	571.20	*a*	571.30	571.40	571.20	571.50	571.20	571.70	571.30
16......	*a*	570.00	570.60	571.20	571.50	571.30	571.60	571.20	571.40	*a*	571.30	571.20
17......	570.75	570.00	570.70	*a*	571.50	571.20	*a*	571.20	571.40	571.20	572.00	571.10
18......	570.50	570.00	571.60	571.20	571.60	571.10	571.20	571.30	*a*	571.20	571.80	*a*
19......	571.10	570.00	571.70	571.20	571.40	*a*	571.30	571.30	571.30	571.10	571.70	571.10
20......	571.10	*a*	*a*	572.00	571.40	571.00	571.40	571.30	571.20	571.00	*a*	571.10
21......	571.50	570.20	572.00	571.00	571.50	570.90	571.60	*a*	571.30	571.00	571.10	571.00
22......	572.00	570.20	571.70	571.20	*a*	570.90	571.70	571.40	571.10	571.20	571.50	571.00
23......	*a*	569.20	571.60	571.20	571.40	570.80	571.60	571.30	571.10	*a*	571.00	571.00
24......	571.60	569.20	571.40	*a*	571.40	570.80	*a*	571.30	571.00	571.50	571.00	571.00
25......	571.50	569.00	571.20	571.60	571.50	570.60	571.80	571.30	*a*	571.70	571.00	*a*
26......	571.50	569.00	571.00	572.00	571.60	*a*	571.70	571.60	571.30	572.00	571.90	571.10
27......	571.70	*a*	*a*	572.00	571.70	570.60	571.90	571.40	571.20	571.70	*a*	571.20
28......	571.40	572.10	570.80	572.40	571.70	570.70	571.90	*a*	571.10	571.70	571.50	571.20
29......	571.00	......	571.30	572.40	*a*	571.00	571.80	571.10	571.10	571.70	571.70	571.20
30......	*a*	......	571.10	572.60	571.60	571.10	571.80	570.80	571.00	*a*	572.00	571.20
31......	571.00	......	571.20	......	571.60	......	*a*	571.00	......	571.60	......	571.20

a No record; Sundays. *b* No record.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Erie Canal at Change Bridge, Pendleton, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	570.90	571.50	576.60	571.20	573.60	571.30	570.95	571.80	570.80	571.25	571.50	571.98
2......	570.80	571.00	578.40	571.10	573.20	571.20	570.85	571.80	570.65	571.00	571.60	571.75
3......	570.80	570.50	579.60	571.02	575.45	570.95	571.25	571.40	571.10	570.90	571.10	571.50
4......	570.90	571.00	580.35	571.15	574.70	570.85	570.80	571.30	571.30	570.90	571.10	571.50
5......	570.95	571.00	580.00	571.20	573.75	571.10	570.75	571.20	571.50	571.00	571.20	571.30
6......	571.00	570.20	578.80	571.30	572.70	571.15	570.80	571.30	571.80	571.05	571.60	571.00
7......	571.50	570.00	577.65	571.30	571.30	571.20	570.90	571.10	571.65	571.30	571.60	571.20
8......	571.50	569.90	576.50	571.20	571.80	571.40	571.05	571.00	571.85	571.70	571.10	571.10
9......	571.60	569.75	575.70	571.15	571.40	571.25	571.20	571.10	572.00	571.70	571.15	571.10
10......	571.50	569.65	574.30	571.15	571.00	571.10	571.20	571.15	571.90	571.50	571.60	571.05
11......	571.40	569.90	572.50	571.10	571.10	570.80	571.10	571.10	571.60	571.70	572.05	571.10
12......	571.35	569.80	571.80	571.10	571.20	571.30	571.15	571.10	571.30	571.30	571.90	571.05
13......	571.00	569.70	571.90	571.15	570.80	571.25	571.15	571.00	571.40	570.90	571.80	571.20
14......	570.50	569.70	571.60	571.15	571.20	571.15	571.18	571.05	571.30	570.90	571.40	571.30
15......	570.50	569.60	571.80	571.10	571.25	571.10	571.20	571.00	571.20	571.00	571.50	571.40
16......	570.40	570.00	571.20	571.10	571.30	571.00	571.15	571.00	571.20	571.10	571.50	571.30
17......	570.40	570.05	571.20	571.20	571.30	570.90	571.00	570.95	571.20	571.00	572.10	571.30
18......	570.50	570.20	571.80	571.30	571.40	571.00	571.00	571.15	571.40	570.95	571.80	571.20
19......	571.44	570.20	572.00	571.60	571.50	570.90	571.10	571.15	571.10	570.85	571.60	571.05
20......	571.58	570.00	572.80	571.70	571.20	570.90	571.20	571.05	571.10	570.80	571.10	571.10
21......	572.50	570.30	572.70	571.40	571.35	570.80	571.35	571.15	571.05	570.40	571.20	571.10
22......	574.10	570.10	572.90	571.30	571.20	570.70	571.40	571.20	570.80	571.20	571.20	571.05
23......	573.40	569.90	572.05	571.20	571.30	570.80	571.20	571.10	570.85	571.50	571.00	571.05
24......	573.50	569.60	571.80	571.40	571.15	570.70	571.25	571.00	570.75	571.50	571.50	571.00
25......	573.80	569.30	571.40	572.30	571.30	570.50	571.50	571.20	571.05	571.60	571.60	570.95
26......	573.00	569.40	571.30	574.26	571.40	570.50	571.50	571.00	571.00	571.60	571.70	571.00
27......	572.50	570.60	571.10	574.00	571.50	570.60	571.70	571.10	571.05	571.70	571.60	571.40
28......	572.00	574.60	571.20	573.70	571.50	570.60	571.75	570.95	570.90	571.60	571.50	571.50
29......	571.90	......	571.15	573.75	571.45	570.80	571.72	570.40	570.90	571.60	571.70	571.60
30......	571.85	......	571.30	574.00	571.48	570.90	571.65	570.70	570.80	572.00	572.00	571.55
31......	571.80	......	571.20	......	571.40	......	571.50	571.05	......	571.50	......	571.50

HUDSON RIVER DRAINAGE BASIN.

DESCRIPTION OF BASIN.

The principal sources of Hudson river lie in the wildest portion of the Adirondack mountains, in Essex county, northeastern New York. A number of branches, any one of which might possibly be considered the main stream, form its upper waters; but if the highest collected and permanent body of water be assumed as the true head, then the source of the Hudson becomes Lake Tear-of-the-Clouds, which lies at an elevation of 4,322 feet above tide, in the center of the triangle formed by Mounts Marcy and Skylight and Gray Peak.

The river flows rather irregularly southward until it reaches the northern boundary of Saratoga county, when it makes a sharp turn and flows eastward for about 12 miles by general course, passing through the mountains and forming, as it cuts across the rocky strata, several notable waterfalls. At Sandy Hill, just below Glens Falls, it makes another abrupt turn and flows southward, continuing in this direction until it empties into New York bay.

From Lake Tear-of-the-Clouds to the mouth of the river the distance by water is probably about 300 miles. The total area drained is 13,366 square miles. The river is tidal to Troy, which is also at the head of navigation.

The tributaries of the Hudson are numerous, and many of them are large and important. Indian river, Schroon river, and Sacandaga unite with the main stream above Glens Falls, and between the latter point and Troy, Hudson river receives Batten kill, Fish creek, Hoosic river and the Mohawk. The tributaries below Troy include Catskill, Esopus and Rondout creeks and Wallkill river from the west, and Kinderhook creek, Jansen kill, Wappinger creek, Fishkill creek and Croton river from the east.

LOWER HUDSON RIVER DRAINAGE BASIN.

DESCRIPTION.

Below Troy the bed of Hudson river is depressed below tide-water level. The stage of the stream is controlled by tidal action, by the inflow of the main stream and by the lateral drainage jointly. The drainage tributary to this portion of the stream includes the south and east slopes of the Catskill mountain region on the west bank and a series of streams heading near the New York–Massachusetts and the New York–Connecticut lines on the east. These streams include the principal present and proposed sources of municipal water-supply of New York city.

CROTON RIVER AT CROTON DAM, NEAR OSSINING, N. Y.

A record of the flow of Croton river was maintained at the old Croton dam from January, 1868, to January, 1905, inclusive. Subsequent to January, 1905, the old Croton dam has been submerged and the gaging record has been continued at the new Croton, or Croton Falls dam, which is located a short distance down-stream. The Croton river gaging record, being the longest continuous record maintained in New York state, forms a convenient basis for comparison with the run-off of other streams in southeastern New York.

The results of the gagings of Croton river from 1868 to 1899, inclusive, have been published in the State Engineer's report for 1902, supplement, pages 290 to 299, inclusive. The records there published are the results of what is known as Freeman's recomputation. Reference is made to that report for detailed description of the method of gaging. The original records, as computed by the Department of Water Supply and the Aqueduct Commissioners, have appeared in the several reports of the New York Aqueduct Commissioners. Freeman's recomputation makes the average flow of the stream about 10 per cent less than the original computations. Freeman's recomputation was made many years after the gaging record was instituted and was based on such limited information as could be obtained in 1899, chiefly from the reservoir keepers and gate-tenders and on the recomputation of certain early gagings of flow in the Croton aqueduct.

Shortly after Freeman's recomputation was made the writer went over the same ground, consulting the reservoir and gate-keepers and examining the head gates, gages and aqueducts with a view to ascertaining the general accuracy of the records. It appears probable that Freeman's computation is somewhat more accurate than the original computations of gagings for recent years, but it does not appear justified as to gagings for the earlier years covered by the record. It does not appear that the degree of accuracy which has been assigned to Freeman's recomputation, namely, a maximum probable error of 5 per cent for any single month, is justified, and it is advised that this record, either in the original form or as recomputed, should be used with the understanding that it appears probable that it is reasonably accurate for most of the period which it covers, but that individual months may be in error considerably more than 5 per cent. Owing to the continually changing conditions as to the extent of water storage, this record is of less value for the purpose of determining the relation between the run-off in different years than a record where conditions have remained substantially unchanged. In order to avoid this difficulty and to make the record as nearly comparable as possible throughout, the results have been published in three different forms: (1) Showing the actual observed flow at the Croton dam, that is, the amount of waste over the dam plus the amount diverted into the Croton aqueduct. (2) The natural average flow at the Croton dam, the flow in each month being corrected for gain or loss of storage at the Croton dam. (3) The natural average monthly flow as it would have been, if the drainage area and water-surface throughout the entire record had been the same as at the completion of the Cross river and Croton Falls reservoirs.

It has been the almost invariable practice of the U. S. Geological Survey and this Department in publishing stream gaging records, to present the actual mean flow of the stream at or past the point of gaging. This may represent the natural regimen of the stream, but usually it is the natural regimen as modified by pondage or other artificial conditions. In the case of the Croton river the waste over the Croton dam, plus the amount diverted into the Croton aqueducts, represents the amount which passed down-stream from the gaging station, and that is the form in which the record is here reproduced. The following tables show the mean daily flow on this basis in millions of U. S. gallons per

24 hours, in cubic feet per second, in second-feet per square mile and inches on the drainage area for the years 1900 to 1906, inclusive.

This data has been obtained from the "Tables and Data Relating to the Flow of the Croton River, 1868 to 1906," published by the Aqueduct Commissioners of the State of New York. The drainage area has been taken as 338.8 square miles preceding February 1, 1905, and as 360.4 square miles subsequent to February 1, 1905. These figures represent the areas tributary to the old Croton dam and the Croton Falls dam, respectively.

Observed Mean Daily Flow of Croton River at Croton Dam, in Millions of U. S. Gallons per 24-hour Day.

MONTH.	1900.	1901.	1902.	1903.	1904.	1905.	1906.
January	255.2	248.3	801.8	649.0	492.3	673.0	298.2
February	885.8	250.2	623.5	747.9	553.2	296.3	297.3
March	847.0	496.8	1,797.1	1,138.5	1,022.3	542.9	311.6
April	353.5	1,030.8	665.4	667.2	561.5	634.4	296.0
May	393.1	753.3	350.5	263.1	293.6	290.8	294.2
June	246.0	371.5	255.3	490.2	295.3	290.8	303.9
July	252.9	299.1	254.7	354.7	288.3	300.8	303.2
August	255.1	636.8	261.0	269.5	282.4	294.4	292.6
September	255.1	440.1	268.1	351.7	353.7	297.3	312.8
October	255.3	495.1	271.1	912.1	283.1	298.5	309.9
November	255.9	275.5	266.6	399.5	277.5	304.7	310.4
December	278.3	819.2	614.4	485.8	287.9	299.2	324.8

Observed Mean Daily Flow of Croton River at Croton Dam, in Second-feet.

MONTH.	1900.	1901.	1902.	1903.	1904.	1905.	1906.
January	396	385	1,243	1,006	763	1,043	462
February	1,373	388	966	1,159	857	459	461
March	1,313	770	2,785	1,765	1,585	841	483
April	548	1,598	1,031	1,034	870	983	459
May	609	1,168	543	408	455	451	456
June	381	576	396	760	457	451	471
July	392	464	395	550	447	466	470
August	395	987	405	418	438	456	454
September	395	682	416	545	548	461	485
October	396	767	420	1,414	439	463	480
November	397	427	413	618	430	472	481
December	431	1,270	952	753	446	464	503

Monthly Run-off of Croton River at Croton Dam, in Cubic Feet per Second per Square Mile.

MONTH.	1900.	1901.	1902.	1903.	1904.	1905.	1906.
January	1.17	1.14	3.67	2.97	2.25	3.08	1.28
February	4.05	1.15	2.85	3.42	2.53	1.27	1.28
March	3.88	2.27	8.22	5.21	4.68	2.33	1.34
April	1.62	4.72	3.04	3.06	2.57	2.73	1.27
May	1.80	3.45	1.60	1.20	1.34	1.25	1.26
June	1.12	1.70	1.17	2.24	1.35	1.25	1.31
July	1.16	1.37	1.17	1.62	1.32	1.29	1.31
August	1.17	2.91	1.20	1.24	1.29	1.26	1.26
September	1.17	2.01	1.23	1.61	1.62	1.28	1.34
October	1.17	2.26	1.24	4.18	1.29	1.28	1.33
November	1.17	1.26	1.22	1.82	1.27	1.31	1.33
December	1.27	3.74	2.81	2.22	1.32	1.29	1.40

Monthly Run-off of Croton River at Croton Dam, in Depth in Inches on Drainage Area.

MONTH.	1900.	1901.	1902.	1903.	1904.	1905.	1906.
January	1.35	1.31	4.23	3.42	2.59	3.55	1.48
February	4.22	1.20	2.97	3.56	2.64	1.32	1.33
March	4.47	2.62	9.48	6.01	5.40	2.69	1.54
April	1.81	5.27	3.39	3.41	2.87	3.05	1.42
May	2.08	3.98	1.85	1.38	1.54	1.44	1.45
June	1.25	1.90	1.30	2.50	3.00	1.40	1.46
July	1.34	1.58	1.35	1.89	1.52	1.49	1.51
August	1.35	3.36	1.38	1.43	1.49	1.45	1.45
September	1.30	2.24	1.37	1.80	1.81	1.43	1.50
October	1.35	2.61	1.43	4.82	1.49	1.48	1.53
November	1.30	1.41	1.36	2.03	1.42	1.46	1.43
December	1.46	4.31	3.24	2.56	1.52	1.49	1.61

RONDOUT CREEK DRAINAGE BASIN.

DESCRIPTION.

Rondout creek has its source in the heart of the timber-covered mountain group forming Wittemberg chain. It flows southeasterly to Napanoch, where it encounters the foot of Shawangunk range, turns abruptly to the northeast and enters the Hudson river at Rondout. Its watershed on the south is very restricted, as it is separated from the Wallkill river only by the narrow Shawangunk ridge. Notable waterfalls occur at Honk Falls and Napanoch over Hudson river shale, and on Good Beer kill above Ellenville. On Good Beer kill there is a total fall of 870 feet from the Cape, three miles above Ellenville, to Ellenville. Of this about 200 feet are concentrated in a series of cascades, called Hanging Rock falls.

Water power was originally developed at Napanoch in 1754. At present there are five dams in this village, utilizing a total of 115 feet fall. A series of cascades, involving a descent of about 50 feet, occur at High Falls, where the water flows over Rosendale cement rock.

RONDOUT CREEK AT ROSENDALE, N. Y.

The Rosendale gaging station is located on the highway bridge and was established by Robert E. Horton for the United States Geological Survey in coöperation with the New York City Water Supply Departments on July 6, 1901; it was assumed by the Board of Water Supply of the city of New York on June 1, 1907, at which time a new standard Board of Water Supply chain gage was put in to replace the old one.

Measurements are taken from the bridge at high and medium stages and by wading at a point about 1,000 feet below the bridge at low stages.

The gage is located on the down-stream side of the bridge in the middle panel.

The water is confined to one channel under the single-span steel bridge, which is 135.7 feet between abutments, at all stages.

A portion of the water of the creek is diverted by a dam below High Falls and sent through the Delaware and Hudson canal, and is discharged into the creek below the gaging station. At Creek Locks, which is about 1½ miles below Rosendale, there is an overflow weir, from which the approximate discharge of the canal may be obtained. The weir, which has a crest of 3.8 feet, is located at the left end of the lock and is equipped with a standard Board of Water Supply staff gage.

The records here published have been furnished by J. Waldo Smith, Chief Engineer, Board of Water Supply of the City of New York.

Mean Daily Discharge, Second-feet, of Rondout Creek, including D. & H. Canal, at Rosendale, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1	232	693	1,320	1,217	2,918	325	255	57	75	208	103	207
2	256	677	1,217	1,073	3,808	304	232	40	101	179	111	243
3	250	645	1,109	933	3,665	268	245	47	78	158	101	220
4	292	605	957	869	2,642	266	189	54	69	145	88	192
5	869	565	837	821	1,892	380	152	86	57	135	78	166
6	7,400	805	709	773	1,422	377	118	73	52	118	71	162
7	4,150	877	629	789	1,063	341	102	66	50	98	64	160
8	2,344	789	549	950	2,277	315	119	56	53	91	93	160
9	4,200	805	605	838	1,949	285	102	49	48	81	87	160
10	2,474	1,127	1,413	761	1,341	304	85	40	81	86	88	205
11	1,457	1,787	2,000	663	1,120	563	77	33	176	81	87	205
12	821	1,360	1,500	584	1,013	467	72	24	129	101	90	178
13	340	1,271	1,280	506	953	465	81	33	106	87	92	170
14	292	1,163	1,037	1,462	865	430	81	35	96	82	86	3,225
15	821	1,330	941	3,362	803	387	81	31	87	152	82	2,539
16	1,055	1,280	869	2,125	769	363	79	153	75	129	90	208
17	933	1,820	805	1,604	864	736	93	865	64	113	83	135
18	1,163	1,952	749	1,293	777	4,112	110	738	67	100	90	104
19	1,091	2,024	677	1,113	722	1,446	105	504	68	97	84	100
20	821	18,300	629	905	642	831	91	327	61	99	94	108
21	821	5,200	581	961	592	671	87	231	64	93	101	129
22	797	3,100	533	1,131	671	504	80	153	77	118	100	139
23	933	2,526	493	1,395	631	424	121	159	127	173	72	312
24	1,820	4,050	437	1,282	558	402	190	158	152	156	78	333
25	3,595	3,475	2,910	1,163	478	361	134	140	152	141	75	333
26	2,700	2,192	5,500	1,075	449	325	97	111	127	131	88	317
27	1,235	1,820	2,840	1,168	456	301	102	77	151	118	89	306
28	957	1,534	2,192	1,315	617	290	91	72	268	107	121	295
29	629	......	1,838	1,827	481	316	85	69	256	99	159	311
30	741	......	1,555	2,377	415	279	79	60	231	93	190	339
31	709	......	1,391	......	360	......	79	61	......	99	......	339
Mean	1,497	2,278	1,294	1,211	1,209	561	117	126	103	111	95	387

Mean Daily Discharge, Second-feet, of Rondout Creek, including D. & H. Canal, at Rosendale, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	165	853	9,000	1,127	1,542	581	244	62	76	100	79	298
2	155	789	6,600	893	1,317	533	208	76	94	108	85	280
3	133	757	5,700	765	1,146	509	178	85	141	82	141	250
4	165	717	4,200	757	1,692	485	154	108	437	85	581	232
5	122	677	3,660	813	1,435	523	138	322	501	108	1,832	220
6	128	677	3,358	757	1,112	1,912	141	186	398	120	933	220
7	621	677	4,800	1,015	988	1,225	116	162	328	120	525	250
8	920	320	4,400	983	932	829	112	135	292	108	509	262
9	672	305	3,078	897	998	798	100	100	256	141	469	268
10	448	294	2,318	762	971	869	108	162	232	147	445	232
11	330	254	1,928	698	861	837	154	1,490	208	116	445	208
12	282	280	1,677	657	772	1,046	147	421	190	100	437	190
13	290	294	2,000	618	700	1,073	135	250	186	88	429	190
14	305	255	1,545	586	556	983	141	178	186	85	405	190
15	350	224	1,391	537	540	901	135	141	186	76	391	180
16	820	224	1,479	538	540	829	154	144	182	85	377	170
17	290	252	1,290	618	548	757	150	123	162	88	370	170
18	348	272	1,145	4,059	539	741	144	116	141	85	352	170
19	560	300	1,046	5,609	516	709	147	108	150	82	304	170
20	290	629	983	3,422	492	661	150	178	150	85	220	170
21	860	901	2,120	2,637	490	581	154	141	150	85	220	170
22	15,525	3,800	1,952	1,771	457	501	147	108	141	88	292	170
23	6,[illegible]00	2,120	1,892	1,259	443	429	135	129	123	100	310	178
24	3,162	1,271	2,266	1,070	437	377	100	108	116	100	316	1,110
25	2,156	1,028	2,565	1,575	549	310	82	82	100	100	352	685
26	1,490	1,253	3,050	19,510	524	268	66	85	91	100	316	430
27	1,370	1,154	2,144	6,708	509	244	82	88	108	100	304	364
28	1,190	6,600	1,743	3,757	509	244	70	82	116	94	298	377
29	983	......	1,523	3,084	493	238	58	88	120	82	310	493
30	933	......	1,435	1,984	597	244	60	108	116	79	310	813
31	901	......	1,253	......	621	......	62	85	......	79	......	773
Mean	1,354	970	2,695	2,315	768	674	128	180	189	97	412	319

Monthly Discharge of Rondout Creek, including D. & H. Canal, at Rosendale, N. Y.
[Drainage area, 380 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per Square mile.	Depth in inches on drainage area.
1909.					
January	7,400	232	1,490	3.921	4.519
February	18,300	565	2,278	5.995	6.243
March	5,500	437	1,294	3.405	3.920
April	3,362	506	1,211	3.187	3.559
May	3,808	360	1,200	3.158	3.643
June	4,112	266	561	1.476	1.651
July	255	72	117	0.308	0.355
August	865	24	149	0.392	0.452
September	268	48	106	0.279	0.311
October	208	81	113	0.297	0.342
November	190	64	95	0.250	0.279
December	3,225	100	387	1.018	1.176
The year	18,300	24	751	1.976	26.450
1910.					
January	15,525	122	1,354	3.563	4.104
February	6,600	224	970	2.553	2.655
March	9,000	983	2,695	7.092	8.174
April	19,510	537	2,315	6.092	6.795
May	1,692	437	768	2.021	2.329
June	1,912	238	674	1.774	1.975
July	244	58	128	0.337	0.388
August	1,490	62	180	0.474	0.546
September	501	76	189	0.497	0.554
October	147	76	97	0.255	0.294
November	1,832	79	412	1.084	1.205
December	1,110	170	319	0.839	0.967
The year	19,510	58	841	2.213	29.985

NOTE.— Water let into canal on April 5.

RONDOUT CREEK AT HONK FALLS.

Rondout creek above its junction with Sandberg creek (called also Lackawack creek) at Napanoch is essentially a mountain stream. At Honk Falls a naturally declivity affords a fall of 125 feet over tilted strata of Hudson river shale. This fall has been increased to 147.5 feet by the construction of a masonry dam at the head of the gorge.

Water to feed the turbines is carried to the power house, one-fourth mile below the dam, in a circular steel penstock. The turbines are a special design of the Victor type. The outflow from the turbines passes over a tail-race weir below the power house. All water flowing in the stream passes over either the spillway of the dam or over the tail-race weir. The dam is of concrete masonry. It has an ogee shaped cross-section and a level spillway, 186.6 feet in length.

A Friez recording gage is maintained by the Board of Water Supply of the City of New York and a record of the water used by the turbines in the power plant is also kept.

The records of flow at this gaging station from February 13, 1906 to 1910, inclusive, have been furnished for publication by Mr. J. Waldo Smith, Chief Engineer of the Board of Water Supply of the City of New York.

Mean Daily Discharge, Second-feet, of Rondout Creek at Honk Falls.

DAY.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1906.											
1	......	107	430	176	176	226	76	68	32	77	73
2	......	108	339	172	155	276	65	65	26	60	54
3	......	204	298	201	130	296	91	54	25	60	56
4	......	1,450	344	167	108	432	27	59	25	54	40
5	......	893	495	155	127	224	93	37	25	56	59
6	......	750	725	155	181	188	74	36	25	51	180
7	......	609	483	161	124	150	68	34	28	46	198
8	......	531	396	144	117	122	111	31	28	43	131
9	......	405	358	243	110	111	93	29	28	43	111
10	......	308	1,182	222	130	108	68	28	28	42	85
11	......	232	1,019	181	104	100	74	28	28	51	150
12	......	167	755	176	82	88	56	29	26	93	88
13	136	155	640	169	73	73	53	31	23	54	82
14	113	145	564	137	63	62	50	20	23	46	76
15	108	124	3,450	133	59	80	48	25	34	43	105
16	114	158	1,550	127	472	85	46	20	26	45	186
17	170	145	786	119	411	117	46	25	26	39	128
18	170	147	596	124	411	124	45	22	23	80	97
19	136	110	450	114	545	119	43	20	26	344	65
20	110	141	412	100	507	119	87	28	472	228	80
21	128	121	356	91	289	105	79	56	190	200	142
22	498	116	325	90	275	102	97	59	108	186	127
23	230	99	368	84	235	77	85	68	73	152	90
24	159	82	342	80	228	87	66	36	56	135	56
25	249	102	290	99	184	67	62	26	394	118	119
26	340	97	249	77	158	56	56	25	264	110	150
27	189	179	229	870	134	54	96	26	170	104	102
28	101	440	206	800	122	51	77	28	144	93	90
29	......	405	186	425	119	54	73	25	56	77	84
30	......	384	198	252	107	136	54	60	100	68	80
31	......	699	......	210	......	88	102	......	83	......	73
Mean	184	310	601	202	198	128	73	37	85	93	102

Mean Daily Discharge, Second-feet, of Rondout Creek at Honk Falls.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1......	116	391	230	276	110	197	*48.0	18.9	1.9	301	278	177
2......	135	394	185	226	102	390	*33.0	20.1	12.1	231	365	150
3......	155	353	224	198	101	253	*23.0	20.0	10.2	187	1,386	150
4......	174	277	136	176	266	172	23.0	18.9	24.1	501	256	150
5......	193	252	106	176	195	230	25.4	19.0	27.8	362	137	164
6......	213	262	102	148	128	288	28.5	19.0	27.1	279	498	163
7......	232	272	71	106	146	204	*23.0	19.6	28.5	*214	3,396	164
8......	416	284	98	80	218	176	26.4	19.5	19.6	*201	1,358	153
9......	387	294	84	87	177	156	23.8	20.1	28.2	*398	766	164
10......	259	305	155	258	160	130	24.6	20.0	26.6	*336	629	1,267
11......	234	316	224	175	136	121	29.6	21.5	389.0	*294	555	1,047
12......	211	238	294	139	120	114	29.1	30.8	491	*246	446	590
13......	184	336	357	127	123	110	32.0	29.9	248	217	374	404
14......	223	374	425	120	118	96	23.4	29.9	186	190	325	408
15......	258	327	495	133	106	87	26.6	29.2	128	172	279	396
16......	180	292	558	147	395	76	26.6	31.9	118	158	262	354
17......	110	268	446	159	465	61	18.7	33.6	97.3	148	207	307
18......	190	172	476	160	306	56	15.8	20.3	76.9	143	206	280
19......	174	161	358	178	235	120	23.2	21.8	82.8	127	205	236
20......	384	178	296	179	196	75	18.1	21.5	82.3	133	182	212
21......	281	152	288	193	166	60	13.3	15.6	81.2	132	201	211
22......	158	115	506	191	144	50	19.3	15.0	71.6	115	280	214
23......	141	136	1,024	222	137	51	18.4	15.0	184	118	217	513
24......	202	214	846	244	125	39	18.4	17.5	397	112	191	877
25......	264	188	546	230	105	38	18.4	9.3	197	103	256	503
26......	326	154	432	217	144	41	19.4	3.2	83.1	93.6	264	404
27......	388	182	405	214	147	44	18.1	1.1	120	96.8	230	347
28	452	162	468	162	144	37	18.1	7.6	114	1,036	214	368
29......	379	......	512	122	131	31	17.0	13.5	648	964	215	*360
30......	405	......	435	122	136	*66	19.2	7.1	480	612	192	*500
31......	346	......	338	......	140	......	19.2	3.6	......	439	......	*540
Mean...	251	252	359	172	172	119	23.0	19.0	149	279	479	380

* Estimated.

Mean Daily Discharge, Second-feet, of Rondout Creek at Honk Falls.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
1......	*367	*127	165	654	1,583	257	30	45	12	32	50	31
2......	*282	155	246	692	752	210	30	34	14	29	56	29
3......	245	155	240	579	580	179	36	31	14	32	48	*31
4......	214	189	187	446	466	155	55	29	14	15	42	*31
5......	200	*184	167	388	387	139	63	29	16	22	42	*34
6......	185	*169	153	419	343	119	52	31	14	22	40	*23
7......	268	*254	180	430	467	116	39	36	14	22	43	*50
8......	451	*169	166	769	809	115	36	36	16	22	37	*186
9......	341	130	154	1,143	536	99	33	26	14	12	37	*161
10......	244	130	108	692	431	104	30	37	14	6	39	*132
11......	231	*282	112	608	370	91	30	37	14	6	40	*105
12......	624	*268	193	516	314	86	24	34	16	6	31	*138
13......	798	*226	295	431	266	75	30	37	9	6	32	*101
14......	472	210	625	375	248	66	32	39	9	6	34	*70
15......	350	2,361	589	395	263	65	29	42	11	6	26	*65
16......	230	1,319	738	454	231	124	30	23	11	6	42	*60
17......	271	526	429	356	208	56	31	39	11	8	39	*57
18......	254	325	321	321	200	42	31	37	11	8	40	*51
19......	208	244	797	372	182	38	23	37	12	17	32	*91
20......	179	274	607	340	191	40	26	37	9	15	32	*112
21......	174	206	413	331	224	30	28	28	·11	17	39	*62
22......	195	186	393	288	1,342	34	28	22	11	15	28	*54
23......	178	175	423	270	960	33	28	14	11	15	45	*46
24......	153	179	929	250	672	47	28	14	11	17	40	*46
25......	124	203	736	243	451	35	*56	12	11	11	40	*46
26......	144	149	553	319	364	32	*113	28	11	8	34	*85
27......	192	263	864	280	320	33	*62	34	6	56	37	*62
28......	148	152	1,432	744	254	23	*51	31	28	133	37	*54
29......	154	135	1,849	484	224	32	*45	23	37	220	23	*36
30......	88	......	1,138	451	214	31	*45	11	35	89	36	*101
31......	93	......	804	......	368	......	*45	11	......	68	......	......
Mean...	260	322	516	468	459	84	39	30	14	31	38	72

* Estimated from record of Fries water stage register at dam and tail race.

Mean Daily Discharge, Second-feet, of Rondout Creek at Honk Falls.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1......	85	169	356	350	870	113	107	30	30	46	39	17
2......	71	175	356	305	1,065	101	101	17	28	22	39	22
3......	68	178	328	296	881	91	84	13	17	12	39	16
4......	85	164	297	350	768	91	24	17	17	30	39	32
5......	288	155	246	311	604	115	42	26	17	37	39	28
6......	2,229	300	195	271	390	124	46	31	16	14	39	36
7......	1,034	288	197	271	353	110	39	17	16	18	6	36
8......	582	226	175	288	656	104	43	7	16	12	47	36
9......	763	212	181	249	497	102	42	7	16	23	28	65
10......	477	288	509	223	395	108	40	10	22	1	11	57
11......	328	528	490	186	409	145	23	22	16	12	65	45
12......	232	351	319	178	339	114	42	22	14	31	25	16
13......	119	328	266	152	271	82	42	22	16	24	23	32
14......	130	351	271	401	246	159	39	20	16	37	6	252
15......	232	404	280	1,124	229	206	36	14	19	50	19	152
16......	254	1,040	248	822	218	135	35	23	24	40	14	108
17......	226	1,102	237	514	254	180	39	144	24	8	21	96
18......	311	611	203	406	218	682	22	51	30	14	18	96
19......	277	1,183	198	333	203	305	51	24	26	14	26	41
20......	220	3,654	181	274	186	198	48	24	28	15	26	50
21......	201	1,174	155	282	181	96	42	24	31	37	6	51
22......	181	944	149	356	209	70	40	24	32	30	26	46
23......	243	746	142	418	184	58	60	24	43	39	35	51
24......	511	1,282	141	396	170	96	96	24	62	23	51	57
25......	876	1,295	1,148	339	144	124	31	24	46	54	39	53
26......	655	853	823	311	124	107	42	24	10	35	39	42
27......	350	571	507	311	130	72	45	24	43	36	39	53
28......	280	475	507	418	189	110	42	24	37	50	6	51
29......	158	......	481	424	144	102	42	24	42	23	18	48
30......	198	......	416	616	119	99	46	24	48	36	18	51
31......	203	......	362	......	102	......	14	32	......	6	......	51
Mean...	383	680	335	372	347	140	47	26	27	27	28	58

Mean Daily Discharge, Second-feet, of Rondout Creek at Honk Falls, and Lackawack.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	43	220	2,340	432	391	120	65	22	22	40	27	65
2......	40	200	1,710	341	335	118	62	22	24	35	28	60
3......	73	195	1,480	319	456	114	51	25	85	40	36	58
4......	45	144	1,090	200	714	102	50	38	182	34	167	57
5......	50	121	955	210	459	104	39	109	138	28	243	58
6......	64	84	875	200	394	355	34	46	109	35	180	78
7......	152	67	1,250	260	353	188	34	34	126	32	132	95
8......	183	90	1,150	255	321	154	36	32	87	45	114	80
9......	155	143	800	230	356	139	37	30	76	45	104	80
10......	98	132	605	200	327	164	44	46	65	42	102	98
11......	89	121	505	206	278	230	44	159	59	34	112	115
12......	69	141	440	206	241	237	38	69	55	31	107	120
13......	88	81	520	205	183	206	31	44	64	30	108	119
14......	88	102	400	198	173	162	30	36	123	31	99	142
15......	100	140	360	205	168	144	28	32	79	28	91	122
16......	70	112	385	205	160	142	32	30	64	30	83	115
17......	124	101	336	121	147	155	71	28	60	38	80	211
18......	121	107	236	1,050	174	164	50	27	51	31	78	144
19......	144	107	245	1,450	158	171	42	38	54	31	72	153
20......	122	113	313	890	140	138	51	38	51	31	67	135
21......	132	235	452	690	196	120	40	28	47	31	68	115
22......	4,050	990	430	460	171	112	40	27	42	36	66	102
23......	1,690	550	436	330	157	103	39	25	38	41	64	115
24......	825	330	570	180	149	84	33	23	40	43	65	288
25......	560	270	884	410	172	78	32	23	56	33	73	276
26......	390	330	907	5,100	168	83	32	26	81	33	80	225
27......	360	300	678	1,740	146	85	28	24	64	38	67	235
28......	310	1,700	550	980	137	115	26	22	60	31	67	215
29......	254	......	515	895	133	90	25	22	48	32	71	235
30......	240	......	575	515	135	74	26	22	40	28	72	418
31......	230	......	522	......	135	......	28	22	......	35	......	445
Mean...	354	258	725	623	246	142	39	38	70	31	91	154

Monthly Discharge of Rondout Creek at Honk Falls.

[Drainage area, 105 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1906.					
February	498	104	184	1.752	1.822
March	1,450	82	310	2.952	3.401
April	3,450	186	601	5.724	6.382
May	870	77	202	1.924	2.214
June	545	59	198	1.886	2.109
July	432	51	128	1.219	1.395
August	127	43	73	0.695	0.801
September	68	20	37	0.352	0.393
October	472	23	85	0.810	0.934
November	344	39	93	0.886	0.988
December	198	40	102	0.971	1.120
The year (10 months, 16 days)	3,450	20	183	1.743	21.559
1907.					
January	452	110	251	2.390	2.755
February	394	115	252	2.400	2.499
March	1,024	71	359	3.419	3.943
April	276	80	172	1.638	1.830
May	465	101	172	1.638	1.891
June	390	31	119	1.133	1.261
July	48	13	23	0.219	0.252
August	34	1	19	0.181	0.209
September	648	2	149	1.419	1.584
October	1,036	94	279	2.657	3.067
November	3,396	137	479	4.562	5.088
December	1,267	150	380	3.619	4.173
The year	3,396	1	221	2.105	28.552
1908.					
January	798	88	260	2.476	2.859
February	2,361	127	322	3.067	3.311
March	1,849	108	516	4.914	5.661
April	1,143	243	468	4.457	4.976
May	1,583	182	459	4.371	5.038
June	257	23	84	0.800	0.893
July	113	23	39	0.371	0.428
August	45	11	30	0.286	0.330
September	37	6	14	0.133	0.148
October	220	6	31	0.295	0.340
November	56	23	38	0.362	0.404
December	186	29	72	0.686	0.791
The year	2,361	6	194	1.848	25.179
1909.					
January	2,229	68	383	3.648	4.195
February	3,654	155	680	6.476	6.735
March	1,148	141	334	3.181	3.658
April	1,124	152	372	3.543	3.968
May	1,065	102	347	3.305	3.801
June	682	58	140	1.333	1.493
July	107	14	47	0.448	0.515
August	144	7	26	0.248	0.285
September	62	10	27	0.257	0.287
October	54	1	27	0.257	0.296
November	65	6	28	0.267	0.299
December	252	16	58	0.552	0.635
The year	3,654	1	206	1.96	26.167

Monthly Discharge of Rondout Creek at Honk Falls and Lackawack.

[Drainage area, Lackawack, 104 square miles; Honk Falls, 105 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
January	4,050	40	354	3.371	3.885
February	1,700	67	258	2.457	2.562
March	2,340	236	725	6.905	6.960
April	5,100	121	623	5.933	6.616
May	714	133	246	2.365	2.726
June	355	74	142	1.365	1.523
July	71	25	39	0.375	0.432
August	159	22	38	0.365	0.421
September	182	22	70	0.673	0.751
October	45	26	34	0.327	0.377
November	243	27	91	0.875	0.976
December	445	57	154	1.481	1.706
The year	5,100	22	231	2.221	28.935

NOTE.— Records are at Honk Falls up to May 1, 1910, after that date, at Lackawack. Automatic gage established at Lackawack April 14, 1910.

ESOPUS CREEK DRAINAGE BASIN.

DESCRIPTION.

Esopus creek has its source in Winnisook lake on the northwestern slope of Slide mountain, the highest peak of the Catskills.

From Big Indian to Olive Bridge the stream flows through a deep valley, flanked on both sides by timber-covered mountains. Numerous sites for dams or storage reservoirs are offered at points where the valley broadens out for a short distance to receive the inflowing waters of tributaries. The most notable are at Big Indian, where Birch creek enters; at the mouth of Bush kill, at Shandaken; at the mouth of Stone Clove creek, at Phoenicia; at Cold Brook, where Little Beaver kill enters, and at Olive Bridge. The stream channel is relatively broad and shallow. The bed is covered with cobbles and small boulders left behind after the erosion of drift deposits which formerly filled the valley. The descent of the stream is rapid though not precipitous until Olive Bridge is reached. At this point, the stream flows over a rock ledge in a narrow gorge, forming Bishop's Falls. The natural fall is 22 feet and is increased to 28 feet by a timber dam on the crest of the ledge. This dam was originally constructed in 1828. The drainage basin of Esopus creek is mostly shown on the Rosendale, Slide Mountain, Phoenicia and the Kaaterskill quadrangles of the U. S. Geological Survey topographic maps. This stream is of great economical importance, owing to its relatively large yield and its location adjacent to the city of New York, and it has been adopted for the city's water supply. The Ashokan dam and reservoir are now in process of construction by the city. Ashokan dam crosses Esopus creek about one mile down-stream from Bishop's Falls.

ESOPUS CREEK AT MT. MARION, N. Y.

A gaging station was established on Esopus creek at Mt. Marion on April 4, 1907, by the Board of Water Supply of the City of New York. The bed of the stream at this station is rock and the flow is chiefly confined to a narrow, V-shaped, natural trough during low water. The channel is straight for a considerable distance above and below the bridge. The flow is confined to the main channel at all stages of the stream.

Records here published have been furnished by Mr. J. Waldo Smith, Chief Engineer of the Board of Water Supply.

Mean Daily Discharge, Second-feet, of Esopus Creek at Mt. Marion, N. Y.

DAY.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.									
1	......	850	601	329	75	27	2,025	2,280	678
2	......	785	728	254	75	29	1,425	2,000	660
3	......	728	1,460	190	75	39	1,120	8,090	589
4	880	1,136	1,240	171	69	79	1,350	4,625	580
5	805	1,500	1,258	145	63	2,125	1,460	3,190	595
6	728	1,258	1,850	150	69	838	1,120	2,660	430
7	660	1,310	1,524	298	71	487	924	8,800	430
8	660	1,390	1,240	190	63	329	1,216	6,100	410
9	698	1,200	1,040	177	59	260	1,634	3,850	430
10	770	1,104	931	134	59	487	1,310	2,910	3,100
11	740	1,028	770	127	50	862	1,160	2,425	5,650
12	880	898	698	145	46	2,960	1,136	1,975	3,425
13	961	820	610	185	44	1,500	961	1,610	2,350
14	972	752	550	177	46	972	862	1,425	1,850
15	880	678	505	120	44	710	752	1,200	1,850
16	805	910	418	127	41	580	660	961	1,563
17	805	1,746	379	141	39	450	589	862	1,270
18	698	1,286	371	290	41	362	550	795	1,104
19	660	1,286	379	298	39	322	487	785	987
20	678	1,080	329	185	37	290	460	710	862
21	597	910	379	156	39	290	589	698	805
22	565	820	322	120	39	245	505	898	752
23	540	758	284	123	39	390	430	770	924
24	820	710	245	134	44	1,850	418	710	4,500
25	1,425	610	245	115	46	1,160	379	961	3,075
26	1,270	610	209	111	48	820	362	972	2,350
27	1,216	820	201	106	41	660	329	862	1,906
28	1,040	780	199	94	48	580	4,310	785	1,794
29	945	650	190	84	39	3,025	6,130	752	2,280
30	862	601	402	75	39	3,050	4,330	728	2,170
31	......	540	......	84	37	......	2,930	......	2,750
Mean	836	953	652	162	50	859	1,352	2,177	1,681

Mean Daily Discharge, Second-feet, of Esopus Creek at Mt. Marion, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
1......	2,170	*345	750	2,530	8,550	880	145	170	68	150	618	150
2......	1,800	†345	695	2,230	4,590	880	150	150	62	116	520	150
3......	1,500	340	775	1,720	2,830	770	310	128	57	101	440	140
4......	1,260	340	725	1,500	1,980	760	325	132	*45	92	400	120
5......	1,300	340	645	1,260	1,600	*715	925	*120	43	92	360	120
6......	895	335	605	1,290	1,350	640	*560	128	41	86	322	120
7......	930	330	590	1,210	1,375	530	360	128	39	80	285	137
8......	1,290	*326	590	1,290	*7,000	495	250	124	38	80	278	530
9......	1,260	325	590	3,200	4,000	455	210	98	37	74	240	440
10......	930	325	*550	*2,530	2,630	380	190	95	36	74	240	402
11......	840	330	590	2,075	1,980	390	175	112	35	74	230	220
12......	1,390	†330	590	1,790	1,575	330	155	120	34	65	225	315
13......	3,740	*330	1,260	1,540	1,300	295	140	108	33	71	210	300
14......	*2,800	†330	2,830	*1,350	1,150	280	145	98	32	80	195	270
15......	1,870	*4,070	2,910	1,190	1,230	310	140	92	*31	74	210	315
16......	1,600	9,980	*4,630	1,300	1,000	715	135	92	31	68	195	330
17......	1,375	4,960	2,830	1,175	880	480	125	92	31	68	185	315
18......	1,150	*2,310	1,980	1,075	790	340	120	92	31	62	175	246
19......	1,025	1,950	2,530	1,050	725	285	125	86	31	57	165	240
20......	930	1,700	*2,550	1,050	680	250	115	*86	31	62	165	292
21......	880	1,350	1,840	995	800	215	110	83	31	68	170	246
22......	840	1,320	1,700	900	4,210	200	155	80	30	62	165	216
23......	*800	950	1,790	830	7,430	205	155	74	*30	57	165	180
24......	680	840	2,430	790	4,050	185	135	68	30	*62	160	140
25......	730	730	3,050	*840	2,430	*200	130	57	30	62	160	202
26......	680	800	2,300	925	1,800	195	740	62	30	137	175	294
27......	840	*944	*3,510	925	1,530	180	410	92	30	1,320	160	224
28......	860	975	5,400	950	1,150	165	280	86	30	815	175	190
29......	680	830	7,000	1,360	770	160	225	80	46	1,012	160	190
30......	680	....	5,270	1,320	800	155	195	68	230	950	141	150
31......	725	....	3,360	....	1,980	....	175	68	....	730	....	216
Mean...	1,240	1,323	2,157	1,406	2,392	401	242	99	43	223	243	239

* Meter measurement. † Estimated.

Mean Daily Discharge, Second-feet, of Esopus Creek at Mt. Marion, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1......	288	735	1,470	1,158	1,882	515	239	80	94	169	80	138
2......	288	635	1,350	1,052	2,700	443	239	74	87	141	77	134
3......	288	685	1,259	1,035	2,107	427	210	68	80	130	80	126
4......	303	828	1,161	1,175	2,040	395	195	70	80	122	80	126
5......	600	912	1,035	1,088	1,747	525	173	91	74	125	80	115
6......	7,350	1,486	951	1,035	1,590	615	159	94	68	115	87	115
7......	4,100	1,486	912	1,122	1,470	515	177	83	68	111	80	118
8......	2,380	1,259	810	1,570	1,770	403	159	74	63	105	74	150
9......	1,770	979	840	1,470	1,550	387	146	68	63	101	71	168
10......	1,300	852	1,210	1,122	1,370	455	146	68	70	94	80	130
11......	1,090	2,880	2,580	1,000	1,770	650	135	68	111	87	68	130
12......	950	1,680	1,860	915	1,410	600	122	63	146	97	74	112
13......	735	1,635	1,454	855	1,175	500	122	58	119	101	68	115
14......	700	1,617	1,245	5,970	1,052	525	122	58	101	101	74	900
15......	725	1,534	1,119	7,410	1,000	575	122	58	87	105	77	1,702
16......	600	2,103	1,021	4,825	1,035	615	115	155	87	101	71	1,035
17......	550	4,010	965	2,040	1,510	685	108	840	87	91	80	725
18......	750	2,430	840	2,107	1,430	2,844	115	768	94	87	80	637
19......	810	2,380	768	1,770	1,157	1,707	115	455	94	78	80	475
20......	725	17,850	750	1,470	1,052	1,189	108	312	87	87	77	345
21......	625	7,500	685	1,280	982	979	115	247	74	83	74	260
22......	550	4,150	650	1,350	948	780	108	206	80	87	80	247
23......	600	3,036	585	1,210	965	685	108	173	87	87	68	260
24......	870	3,590	575	1,262	840	600	138	155	105	80	77	240
25......	2,130	5,300	3,216	1,158	750	515	138	146	119	83	94	205
26......	2,040	3,190	6,870	1,070	665	435	135	138	111	91	94	179
27......	1,550	2,330	3,320	1,000	625	363	122	130	108	105	115	189
28......	1,315	1,995	2,604	1,140	1,000	335	111	122	115	97	112	189
29......	1,000	....	2,103	1,018	780	312	94	111	210	87	112	199
30......	870	....	1,725	1,175	665	265	94	97	195	83	130	170
31......	810	....	1,406	....	585	....	87	87	....	80	....	155
Mean...	1,247	2,824	1,527	1,757	1,278	661	138	168	99	100	83	316

Mean Daily Discharge, Second-feet, of Esopus Creek at Mt. Marion, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	155	900	10,440	1,815	1,995	395	288	80	63	105	68	169
2......	130	675	7,660	1,470	1,590	375	273	80	80	94	68	155
3......	120	735	5,970	1,245	1,430	345	255	80	108	87	91	146
4......	120	715	4,675	1,105	1,887	318	229	115	182	80	138	138
5......	135	665	3,730	1,049	1,510	312	210	155	187	74	575	130
6......	180	585	3,660	979	1,315	1,245	195	135	187	74	515	122
7......	247	222	5,620	1,486	1,140	979	182	111	234	83	347	119
8......	640	190	4,675	1,510	1,021	735	173	97	210	94	288	108
9......	525	282	3,385	1,210	965	650	164	91	177	87	265	101
10......	440	310	2,560	1,070	1,000	575	164	119	159	87	206	91
11......	395	222	2,067	930	840	750	155	169	135	80	222	72
12......	340	222	1,923	1,105	735	1,210	155	187	111	74	222	66
13......	340	210	1,833	951	685	1,374	146	164	105	74	222	78
14......	395	200	1,833	840	600	965	138	135	135	74	215	91
15......	320	222	1,617	768	550	810	130	115	151	68	210	97
16......	318	235	1,430	715	515	840	135	108	146	68	200	104
17......	290	246	1,350	715	467	1,140	141	101	138	68	191	72
18......	267	270	1,161	4,600	443	1,486	138	94	125	68	182	72
19......	510	285	1,161	11,160	467	1,617	130	111	115	68	177	84
20......	690	295	1,259	6,600	435	1,231	122	101	108	68	164	78
21......	605	455	1,860	3,898	455	1,000	115	101	101	63	151	72
22......	18,000	1,370	1,815	2,700	403	810	108	94	101	68	146	72
23......	8,060	1,035	1,905	2,040	363	675	108	94	94	87	146	72
24......	5,668	790	2,130	1,635	387	565	101	87	91	80	146	91
25......	2,676	640	2,916	3,060	415	485	101	87	97	74	151	392
26......	1,923	605	4,010	24,700	675	427	97	87	119	68	164	273
27......	1,653	700	2,796	10,848	550	395	87	80	155	68	159	189
28......	1,390	5,712	2,130	4,870	455	427	80	74	141	63	155	189
29......	1,257	......	1,923	3,125	415	387	80	68	125	68	159	234
30......	1,105	......	2,130	2,480	395	324	80	63	115	68	169	450
31......	965	......	2,260	......	427	......	80	58	......	68	......	410
Mean...	1,608	678	3,029	3,356	791	761	147	105	133	76	204	146

Monthly Discharge of Esopus Creek at Mt. Marion, N. Y.

[Drainage area, 378 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1907.					
April............................	1,425	540	836	2.212	2.466
May............................	1,746	540	953	2.521	2.905
June............................	1,850	190	652	1.725	1.924
July............................	329	75	162	0.428	0.493
August............................	75	37	50	0.132	0.152
September............................	3,050	27	859	2.272	2.533
October............................	6,130	329	1,352	3.577	4.127
November............................	8,800	698	2,177	5.759	6.426
December............................	5,650	410	1,681	4.447	5.130
The year (9 months)..............	8,800	27	969	2.563	26.156
1908.					
January............................	3,740	680	1,240	3.280	3.781
February............................	9,980	325	1,323	3.500	3.775
March............................	7,000	550	2,157	5.706	6.583
April............................	3,200	790	1,406	3.720	4.150
May............................	8,550	680	2,392	6.328	7.298
June............................	880	155	401	1.061	1.183
July............................	925	110	242	0.640	0.738
August............................	170	57	99	0.262	0.302
September............................	230	30	43	0.114	0.127
October............................	1,320	57	223	0.590	0.680
November............................	618	141	243	0.643	0.717
December............................	530	120	239	0.632	0.729
The year............................	9,980	30	834	2.206	30.063

Monthly Discharge of Esopus Creek at Mt. Marion, N. Y.— (Continued).
[Drainage area, 378 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1909.					
January	7,350	288	1,247	3.299	3.805
February	17,850	635	2,824	7.471	7.779
March	6,870	575	1,527	4.040	4.658
April	7,410	855	1,757	4.648	5.188
May	2,700	592	1,278	3.381	3.897
June	2,844	265	661	1.749	1.952
July	239	87	138	0.365	0.421
August	840	58	168	0.444	0.512
September	210	63	99	0.262	0.292
October	169	78	100	0.264	0.304
November	130	68	83	0.220	0.245
December	1,702	112	316	0.836	0.964
The year	17,850	58	850	2.249	30.017
1910.					
January	8,000	120	1,608	4.254	4.900
February	5,712	190	678	1.794	1.864
March	10,440	1,161	3,029	8.013	9.235
April	24,700	715	3,356	8.878	9.907
May	1,995	363	791	2.093	2.410
June	1,617	324	761	2.013	2.243
July	288	80	147	0.389	0.448
August	187	58	105	0.278	0.320
September	234	63	133	0.352	0.393
October	105	63	76	0.201	0.232
November	575	68	204	0.540	0.602
December	450	66	146	0.386	0.445
The year	24,700	58	920	2.434	32.999

ESOPUS CREEK AT KINGSTON, N. Y.

This station is located at the Washington street bridge over Esopus creek at Kingston. It is maintained by the New York Board of Water Supply, of which J. Waldo Smith is Chief Engineer, by whom the records have been furnished to this Department.

Mean Daily Discharge, Second-feet, of Esopus Creek at Kingston, N. Y. [a]

DAY.	Jan.	Feb.	Mar.	April.	May.
1909.					
1	279	660	1,360	1,010	*a*
2	223	750	1,074	922	
3	262	770	1,010	910	
4	334	666	946	1,090	
5	684	684	1,162	990	
6	6,150	1,860	706	922	
7	2,725	1,500	684	1,440	
8	2,060	1,158	615	1,710	
9	1,620	978	606	1,250	
10	1,054	1,375	954	1,058	
11	874	2,470	1,512	910	
12	714	1,710	1,674	778	
13	882	1,668	1,098	990	
14	874	1,572	990	4,930	
15	914	1,350	882	5,405	
16	890	1,608	738	3,814	
17	890	2,435	698	3,030	
18	994	1,740	660	1,530	
19	690	1,425	615	1,270	
20	660	20,500	600	882	
21	710	4,625	564	874	
22	648	2,910	486	994	
23	714	1,440	269	1,046	
24	1,050	2,340	269	1,058	
25	2,200	3,350	2,220	850	
26	2,140	2,172	3,726	858	
27	1,626	1,752	2,112	534	
28	1,405	1,536	1,992	854	
29	1,114		1,860	802	
30	1,034		1,310	1,090	
31	914		1,090		
Mean	1,204	2,393	1,112	1,493	

a This station discontinued May 1, 1909.

ESOPUS CREEK AT WEIR NEAR OLIVE BRIDGE, N. Y.

The weir is constructed of concrete, having a cross-section similar to that experimented on in the hydraulic laboratory at Cornell University by the United States Geological Survey, in Series 30, described in Water Supply and Irrigation Paper No. 200. [a]

The average height of this weir above the rock on which it is founded for its entire length is 7.54 feet; length between abutments, 193.90 feet. In order to form a channel of approach, the abutments have been extended up-stream at right angles with the axis of the weir for a distance of 16 feet and the area of the channel of approach below the crest of the weir is 1,462 square feet. The abutments extend 14 feet above the level of the crest and it is estimated that a flow of 40,000 cubic feet per second can be taken care of.

Measurements of the head on the weir are made in a well 24 inches in diameter, situated 53 feet up-stream from the crest of the weir. Water is admitted to this well through a ¾-inch pipe extending 16 feet out into the stream, in which, spaced 6 inches apart, are ⅛-inch holes bored vertically through the pipe. The center of this pipe is placed 18 inches above the bed of the stream. A continuous record of the head at this point is kept by means of a Friez automatic water-stage register, geared 1 to 1 and running twenty-four hours. Observations of the flow were first begun on October 17, 1906, though the automatic gage register was not installed until December 5. Prior to this latter date heads were read three times daily and reduced in the usual manner.

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[a] "Weir Experiments, Coefficients and Formulas," by Robert E. Horton.

Computations of the discharge over this weir are made from a formula which has been deduced from the results of the experiments made by the United States Geological Survey and referred to above. During the winter the ice which forms between the wing walls that form the channel of approach is kept away so that there may be no change in the conditions of flow due to this cause.

The watershed of Esopus creek above the weir is 239 square miles, as measured on the topographic maps of the United States Geological Survey.

The records here published have been furnished by J. Waldo Smith, Chief Engineer, Board of Water Supply of New York City.

Mean Daily Discharge, Second-feet, of Esopus Creek at Weir near Olive Bridge, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1.....	172	363	918	769	1,296	306	150	64	44	78	53	52
2.....	164	541	852	743	1,498	286	122	84	44	67	53	70
3.....	226	516	818	766	1,280	271	110	78	44	62	55	75
4.....	276	466	686	909	1,433	269	100	72	36	64	62	67
5.....	1,581	570	563	814	1,259	461	89	62	36	67	57	72
6.....	4,735	1,170	527	830	1,154	380	84	62	33	62	53	67
7.....	2,279	659	491	1,554	1,069	314	75	60	33	62	48	72
8.....	1,336	485	440	1,616	1,191	282	72	42	33	57	48	136
9.....	944	380	429	1,192	978	267	72	36	33	53	44	80
10.....	625	1,266	1,028	958	953	323	67	33	74	53	44	94
11.....	522	1,197	1,128	775	1,080	465	67	29	132	48	42	92
12.....	447	836	868	687	886	358	67	28	78	57	33	73
13.....	379	816	80[illegible]	642	798	322	62	26	62	62	33	89
14.....	332	751	725	4,840	716	374	62	28	53	57	29	608
15.....	532	787	652	4,768	682	515	62	23	48	53	33	454
16.....	438	1,754	566	2,975	749	371	62	134	48	48	29	310
17.....	489	2,030	536	2,003	1,022	446	62	656	62	44	33	248
18.....	416	1,408	452	1,517	841	1,152	48	406	62	40	36	211
19.....	300	1,742	401	1,250	764	753	81	248	53	36	34	168
20.....	418	9,376	389	1,072	700	615	76	184	48	33	33	136
21.....	393	3,375	333	953	658	515	48	156	44	40	29	205
22.....	368	2,120	317	888	692	436	36	128	36	44	29	162
23.....	474	1,606	296	854	630	410	64	110	40	48	33	162
24.....	908	2,299	278	797	551	342	140	94	57	53	29	162
25.....	1,130	2,416	2,782	675	480	308	105	84	67	62	37	162
26.....	1,262	1,619	2,382	702	434	271	89	72	48	67	48	162
27.....	1,076	1,367	1,456	61[illegible]	481	235	78	72	48	72	4[illegible]	162
28.....	887	1,168	1,356	660	550	222	67	62	111	72	44	162
29.....	757	......	1,164	664	429	201	62	53	124	62	53	126
30.....	714	......	984	885	374	175	62	53	89	57	70	105
31.....	563	......	807	......	338	......	57	48	......	53	......	154
Mean..	811	1,539	820	1,279	838	388	78	106	57	56	42	158

Mean Daily Discharge, Second-feet, of Esopus Creek at Weir near Olive Bridge, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	220	502	5,157	1,302	1,110	228	182	53	40	57	36	115
2.....	242	466	4,185	1,047	974	222	172	53	50	57	36	105
3.....	228	430	3,168	884	928	201	162	58	94	57	58	105
4.....	185	418	2,337	808	1,048	194	162	60	165	57	158	105
5.....	248	406	1,974	753	856	182	127	110	130	57	454	90
6.....	562	394	1,939	738	757	535	127	95	108	53	278	75
7.....	917	382	2,900	1,269	689	342	113	80	142	57	200	100
8.....	722	370	2,310	909	625	294	110	67	120	72	166	105
9.....	588	327	1,720	754	618	256	111	54	122	66	143	75
10.....	488	284	1,341	662	548	308	94	43	108	58	142	110
11.....	395	240	1,109	590	501	552	102	80	100	58	187	194
12.....	338	234	961	684	440	615	111	80	78	53	200	225
13.....	338	228	931	576	400	546	81	74	72	43	175	225
14.....	311	222	925	534	358	475	72	68	78	43	162	220
15.....	280	216	782	498	333	428	64	62	234	43	148	202
16.....	246	210	690	484	312	470	62	56	144	48	140	175
17.....	259	210	630	464	278	637	84	50	116	43	138	162
18.....	315	210	548	4,612	292	891	60	45	110	38	136	130
19.....	330	210	536	4,538	275	806	62	74	89	38	128	115
20.....	352	210	705	2,885	249	653	62	70	89	36	119	90
21.....	3,213	1,645	973	1,976	267	554	67	67	78	36	112	124
22.....	11,496	1,270	1,006	1,466	246	470	67	64	62	38	114	146
23.....	3,424	880	1,146	1,171	235	406	72	62	62	48	110	510
24.....	1,945	690	1,408	969	242	358	86	61	62	48	110	348
25.....	1,391	578	2,481	2,741	258	316	84	60	118	44	126	228
26.....	1,007	505	2,730	15,388	282	288	72	61	112	44	130	340
27.....	861	1,040	1,874	4,392	247	271	67	61	100	44	114	300
28.....	720	4,372	1,472	2,492	228	281	59	60	94	44	110	355
29.....	658	......	1,418	1,754	208	232	55	59	94	44	123	565
30.....	582	......	1,778	1,415	215	210	53	58	72	40	126	350
31.....	538	......	1,710	......	228	......	53	58	......	40	......	531
Mean...	1,077	606	1,704	1,958	460	407	92	65	101	48	146	210

Monthly Discharge of Esopus Creek at Weir near Oliver Bridge, N. Y.
[Drainage area, 239 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1909.					
January	4,735	164	811	3.393	3.908
February	9,376	363	1,539	6.439	6.706
March	2,782	278	820	3.431	3.954
April	4,840	612	1,279	5.351	5.969
May	1,498	338	838	3.506	4.047
June	1,152	175	388	1.623	1.807
July	150	36	78	0.326	0.376
August	656	23	106	0.444	0.512
September	132	33	57	0.239	0.267
October	78	33	56	0.234	0.270
November	70	29	42	0.176	0.196
December	608	52	158	0.661	0.762
The year	9,376	23	514	2.150	28.774
1910.					
January	11,496	185	1,077	4.506	5.200
February	4,372	210	606	2.536	2.641
March	5,157	536	1,704	7.130	8.220
April	15,388	464	1,958	8.192	9.138
May	1,110	208	460	1.924	2.214
June	891	182	407	1.703	1.897
July	182	53	92	0.385	0.444
August	110	43	65	0.272	0.314
September	234	40	101	0.423	0.472
October	72	36	48	0.201	0.232
November	454	36	146	0.611	0.682
December	565	75	210	0.879	1.013
The year	15,388	36	578	2.397	32.467

NOTE.— On April 26, 1910, occurred the maximum flow, 28,100 second-feet, maintained for 15 minutes.

CATSKILL CREEK DRAINAGE BASIN.

DESCRIPTION.

The basin of this stream receives the run-off from the north slope of the Catskill range and lies, for the most part, in the timbered highlands of Greene county. The slopes are precipitous, there are no lakes, and the amount of artificial storage is small. The underlying rock formation is chiefly Devonian shale. The topography of the area is shown on the Durham, Coxsackie and Catskill sheets of the United States Geological Survey topographic atlas. The stream flows over a rock bed through much of its course and enters tide-water of Hudson river at Catskill.

CATSKILL CREEK AT OAK HILL, N. Y.

Obstructions having been placed in the stream channel adjacent to the former gaging station on Catskill creek at South Cairo, a new station was established by the Board of Water Supply of New York City April 22, 1910, at Oak Hill, N. Y. The village of Oak Hill is about 12 miles up-stream, following the creek channel, from South Cairo. The conditions at this gaging station are stated to be favorable for securing accurate results. The drainage basin in this vicinity is underlaid by Hudson river shale rock and while the stream is somewhat torrential and flashy in its regimen, it is believed that fairly accurate results are obtainable at this gaging station.

The results here presented have been furnished for publication by J. Waldo Smith, Chief Engineer of the Board of Water Supply.

Mean Daily Discharge, Second-feet, of Catskill Creek at Oak Hill, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	66	2	860	390	185	65	31	8	3	8	8	32
2......	73	2	634	312	180	80	25	8	3	8	8	29
3......	68	2	426	264	170	63	26	8	6	8	9	29
4......	56	2	230	242	205	49	22	8	8	8	15	31
5......	75	2	185	226	155	45	20	8	9	8	76	27
6......	168	2	240	222	130	275	17	7	7	8	80	20
7......	275	2	916	380	105	195	15	7	7	8	60	25
8......	216	2	293	272	98	150	14	7	7	8	52	26
9......	176	2	108	226	100	110	12	7	7	8	50	21
10.....	146	2	29	199	105	100	12	8	7	8	50	17
11.....	118	1	7	177	100	215	10	10	6	8	105	22
12.....	101	2	9	202	86	270	10	7	6	8	70	22
13.....	101	2	10	173	77	230	9	7	6	7	63	22
14.....	93	2	9	160	65	150	9	7	9	7	60	22
15.....	84	2	5	149	63	110	8	7	9	7	50	22
16.....	74	2	2	147	56	220	8	7	8	7	48	27
17.....	78	17	1	141	49	275	8	7	8	7	44	27
18.....	94	17	1	1,400	48	550	8	7	8	7	43	24
19.....	99	17	13	1,380	46	350	7	7	8	7	39	24
20.....	106	17	157	855	41	230	7	7	8	7	34	22
21.....	970	17	108	594	43	160	7	7	8	7	29	22
22.....	3,420	645	103	440	39	120	7	5	7	7	29	22
23.....	1,030	333	108	352	37	94	7	5	7	8	29	22
24.....	585	333	108	290	33	290	7	5	7	8	28	88
25.....	418	282	184	822	35	65	7	5	9	8	34	47
26.....	302	266	216	4,610	49	54	7	3	10	8	34	55
27.....	258	1,520	76	1,320	39	49	7	3	10	8	32	55
28.....	216	1,310	29	750	36	54	7	3	9	8	32	49
29.....	197	......	11	270	30	41	7	3	8	8	32	43
30.....	174	......	13	230	29	34	7	3	8	8	32	126
31.....	161	......	9	......	63	......	7	3	......	8	......	55
Mean...	322	172	164	573	81	156	11	6	7	8	42	35

Monthly Discharge of Catskill Creek at Oak Hill, N. Y.

[Drainage area, 70 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
January	3,420	56	322	4.600	5.303
February	1,520	1	172	2.457	2.562
March	916	1	164	2.343	2.698
April	4,610	141	573	8.186	9.138
May	205	29	81	1.157	1.337
June	550	34	156	2.229	2.488
July	31	7	11	0.157	0.181
August	10	3	6	0.086	0.099
September	10	3	7	0.100	0.112
October	8	7	8	0.114	0 131
November	105	8	42	0.600	0 669
December	126	17	35	0.500	0 576
The year	4,610	1	131	1.871	25.294

NOTE.— The first four months are from East Durham records.

KINDERHOOK CREEK.

KINDERHOOK CREEK AT ROSSMAN, N. Y.

A gaging station was established at Rossman highway bridge on Kinderhook creek, March 17, 1906, by Robert E. Horton.

This gaging station is maintained by the U. S. Geological Survey in coöperation with this Department. The gage is of the weight-tape-and-reel pattern, and readings are taken morning, noon and evening by Wesley Ham.

The channel is rock, and is nearly straight for some distance above and below the gage.

The station is above one-quarter mile below a dam, and very little ice obstruction occurs except in extreme cold weather.

A description of Kinderhook creek, with the results of gagings made in 1892–1894, may be found in the report of the State Engineer and Surveyor for 1902, supplement, pages 252–256.

Mean Daily Gage Height, in Feet, of Kinderhook Creek at Rossman, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	26.52	27.50	32.38	27.91	27.71	28.26	26.71	26.42	26.38	26.80	26.62	26.88
2	26.48	27.53	31.65	27.72	27.65	28.37	26.66	26.41	26.40	26.30	26.58	26.95
3	26.57	27.44	30.28	27.64	27.68	28.45	26.65	26.45	26.38	26.59	26.41	26.95
4	26.53	27.53	29.61	27.57	27.74	27.90	26.57	26.42	26.28	26.55	26.85	26.88
5	27.22	27.37	29.36	27.60	27.71	27.73	26.63	26.45	26.38	26.60	27.15	26.88
6	26.79	27.57	29.28	27.55	27.62	28.13	26.54	26.46	26.75	26.59	27.46	26.86
7	......	27.32	30.69	27.62	27.47	28.44	26.56	26.34	27.34	26.58	27.26	26.76
8	......	27.20	29.99	27.80	27.36	28.20	26.55	26.49	27.44	26.54	27.08	26.82
9	27.81	27.28	29.25	27.83	27.36	27.83	26.55	26.48	27.15	26.37	27.02	26.85
10	......	27.22	28.72	27.83	27.42	27.82	26.45	26.46	26.85	26.54	26.95	26.88
11	......	27.24	28.45	27.84	27.42	27.85	26.50	26.59	26.75	26.46	27.22	26.85
12	......	27.43	28.36	28.25	27.36	28.01	26.52	26.66	26.81	26.41	27.25	26.74
13	......	27.39	28.32	28.10	27.30	28.02	26.44	26.58	26.76	26.43	27.28	26.75
14	......	27.37	28.28	28.24	27.00	27.80	26.57	26.42	26.58	26.40	27.12	26.50
15	......	27.25	27.99	27.75	26.97	27.62	26.58	26.35	26.61	26.32	27.22	26.66
16	......	27.38	27.84	27.56	27.09	27.54	26.43	26.39	26.56	26.30	27.10	26.81
17	......	27.43	27.84	27.42	27.13	27.52	26.33	26.37	26.58	26.33	27.20	26.72
18	......	27.44	27.64	27.49	27.05	27.50	26.47	26.44	26.32	26.29	27.28	26.68
19	......	27.30	27.68	27.94	26.94	27.51	26.40	26.42	26.55	26.32	27.08	26.68
20	......	27.05	27.78	27.77	27.20	27.32	26.42	26.40	26.56	26.32	26.87	26.64
21	......	27.38	28.25	27.65	27.07	27.36	26.48	26.38	26.52	26.40	26.92	26.69
22	......	29.15	28.15	27.60	26.99	27.16	26.41	26.45	26.54	26.35	26.98	26.64
23	......	28.93	28.08	27.49	27.22	27.10	26.37	26.51	26.60	26.50	26.86	26.62
24	......	28.52	28.14	27.36	26.99	26.91	26.33	26.50	26.56	26.50	26.84	26.88
25	29.15	28.24	28.35	27.41	26.97	26.85	26.42	26.52	26.41	26.35	26.91	28.10
26	28.65	28.32	28.71	28.36	28.30	26.89	26.31	26.47	26.47	26.44	26.88	28.02
27	28.18	28.20	28.32	28.64	28.13	26.89	26.44	26.47	26.55	26.58	26.82	28.46
28	27.87	31.52	28.23	28.26	27.85	26.85	26.54	26.50	26.60	26.65	27.08	27.75
29	27.69	......	28.07	28.01	27.71	26.84	26.52	26.48	26.46	26.58	27.06	27.72
30	27.56	......	28.04	28.06	27.41	26.74	26.48	26.45	26.66	26.38	27.00	27.52
31	27.53	......	28.04	......	28.06	......	26.32	26.38	......	26.55	......	27.52

Current-meter Discharge Measurements of Kinderhook Creek at Rossman, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
1910.		*Feet.*	*Feet.*	*Square feet.*	*Second-feet.*	*Second-feet.*
Jan. 22 *a*	W. G. Hoyt	34.56	155	1,300	8.46	11,000
April 26	W. G. Hoyt	28.05	148	339	2.68	909
August 25 *b*	J. J. Phelan	26.33	13	9.85	3.86	38.1

a Meter held near surface; measurement largely estimated; 70 ft. near right bank full of floating ice; velocity here determined by timing ice cakes.

b Measurement made by wading in tail race of power plant above. Gives total flow under bridge.

Mean Daily Discharge, Second-feet, of Kinderhook Creek at Rossman, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1.....	40	354	623	1,310	922	195	147	50	36	111	84	94
2.....	47	306	602	1,130	1,090	180	156	60	45	100	80	89
3.....	64	325	575	1,180	947	237	134	36	54	62	66	92
4.....	92	386	582	1,140	1,050	241	70	47	48	77	84	84
5.....	163	202	528	1,010	1,140	221	62	97	45	80	102	56
6.....	2,470	1,180	344	1,050	972	141	100	320	45	70	56	82
7.....	980	1,310	418	1,460	850	191	92	167	48	66	33	68
8.....	688	795	429	1,600	748	265	80	94	52	70	50	89
9.....	680	703	354	1,180	673	156	100	105	64	75	84	84
10.....	483	718	771	1,010	575	191	72	87	58	62	62	87
11.....	447	1,130	2,380	740	502	249	30	100	72	56	52	62
12.....	483	733	1,170	688	483	198	82	66	37	66	58	28
13.....	296	561	1,030	638	447	111	89	40	66	68	42	87
14.....	680	508	733	972	386	141	75	60	66	72	30	122
15.....	391	496	718	3,310	386	184	80	47	68	70	50	173
16.....	489	616	666	2,510	401	170	82	94	70	70	52	180
17.....	508	939	616	1,700	483	167	77	75	54	47	68	170
18.....	458	609	541	1,320	534	997	50	100	44	70	42	153
19.....	441	568	483	1,080	502	771	24	92	36	50	44	64
20.....	418	10,200	508	947	380	483	54	92	36	45	44	66
21.....	370	3,430	391	850	306	401	62	122	29	50	45	50
22.....	296	1,950	424	764	349	288	56	54	33	64	105	58
23.....	195	1,320	386	764	359	237	58	84	30	62	87	84
24.....	412	1,410	364	818	292	274	60	70	52	34	84	77
25.....	972	3,070	458	630	229	301	45	62	36	92	54	68
26.....	914	1,250	2,450	673	195	221	84	75	34	114	68	50
27.....	740	1,180	1,420	659	214	128	80	47	54	102	89	100
28.....	575	1,050	1,560	575	274	187	66	45	111	97	45	119
29.....	718	......	2,170	748	386	233	75	54	225	89	97	173
30.....	380	......	1,520	703	386	163	72	46	147	84	84	163
31.....	588	......	1,320	......	320	......	72	54	......	58	......	68

NOTE.— The above daily discharges are based on a rating curve well defined below 1,720 second-feet. Open water rating curve has been used for entire year.

Mean Daily Discharge, Second-feet, of Kinderhook Creek at Rossman, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	75	470	6,900	756	609	1,040	125	54	47	153	100	180
2.....	66	489	5,600	616	569	1,140	111	52	50	34	89	206
3.....	87	435	3,400	561	588	1,210	108	60	47	92	52	206
4.....	77	489	2,470	515	630	748	87	54	32	82	170	180
5.....	320	396	2,160	534	609	623	102	60	47	94	288	180
6.....	150	515	2,070	502	548	931	80	62	138	92	441	173
7.....	300	370	4,020	548	453	1,200	84	40	380	89	339	141
8.....	400	310	2,990	673	391	988	82	68	435	80	257	160
9.....	680	349	2,030	696	391	696	72	66	288	45	233	170
10.....	700	320	1,450	696	424	688	60	62	170	80	206	180
11.....	700	330	1,210	703	424	710	70	92	138	62	320	170
12.....	800	429	1,130	1,030	391	834	75	111	156	52	334	134
13.....	800	407	1,090	906	359	842	58	89	141	56	349	138
14.....	800	396	1,060	1,020	225	673	87	54	89	50	274	70
15.....	800	334	818	638	214	548	89	42	97	37	320	111
16.....	1,000	401	703	508	261	496	56	48	84	34	265	156
17.....	1,000	429	703	424	278	483	39	45	89	39	310	128
18.....	1,000	435	561	464	249	470	64	58	37	33	349	116
19.....	1,400	359	588	779	202	476	50	54	82	37	257	116
20.....	1,400	245	659	652	310	370	54	50	84	37	177	105
21.....	1,400	401	1,030	568	253	391	66	47	75	50	195	119
22.....	1,400	1,920	947	534	221	292	52	60	80	42	217	105
23.....	1,600	1,670	890	464	320	265	45	72	94	70	173	100
24.....	1,600	1,270	939	391	221	191	39	70	84	70	167	180
25.....	1,920	1,020	1,120	418	214	170	54	75	52	42	191	906
26.....	1,390	1,090	1,450	1,130	1,070	184	36	64	64	58	180	842
27	972	988	1,090	1,380	931	184	58	64	82	89	160	1,220
28.....	726	5,370	1,010	1,040	710	170	80	70	94	108	257	638
29.....	595	.....	882	834	609	167	75	66	62	89	249	616
30.....	508	......	858	874	418	134	66	60	111	47	225	483
31.....	489	......	858	......	874	......	37	47	......	82	......	483
Mean...	(811)	773	1,700	695	450	577	70.0	61.8	114	65.3	238	281

Monthly discharge of Kinderhook Creek at Rossman, N. Y.
[Drainage area, 331 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1909.					
January	2,470	40	532	1.61	1.86
February	10,200	202	1,330	4.02	4.19
March	2,450	344	856	2.59	2.99
April	3,310	575	1,110	3.35	3.74
May	1,140	195	541	1.63	1.88
June	997	111	264	0.798	0.89
July	156	24	77.0	0.233	0.27
August	320	36	82.0	0.248	0.29
September	225	29	59.8	0.181	0.20
October	114	34	72.0	0.218	0.25
November	105	30	64.7	0.195	0.22
December	180	28	94.8	0.286	0.33
The year	10,200	24	416	1.28	17.11
1910.					
January	(1,920)	(66)	(811)	(2.45)	(2.82)
February	5,370	245	773	2.34	2.44
March	6,900	561	1,700	5.14	5.93
April	1,380	391	695	2.10	2.34
May	1,070	202	450	1.36	1.57
June	1,210	134	577	1.74	1.94
July	125	36	70.0	0.211	0.24
August	111	40	61.8	0.187	0.22
September	435	32	114	0.344	0.38
October	153	33	65.3	0.197	0.23
November	441	52	238	0.719	0.80
December	1,220	70	281	0.849	0.98
The year	6,900	32	486	1.47	19.89

NOTE.— The above estimates for winter periods are provisional and subject to revision for purpose of publication in the Federal report for 1910.

MOHAWK RIVER DRAINAGE BASIN.

DESCRIPTION.

Mohawk river, the largest of the tributaries of the Hudson river, rises in the sandy hills south of Boonville, in western New York, about 40 miles from the east end of Lake Ontario. Its uppermost tributaries are fed by large springs, and in addition the stream receives considerable water brought in from the adjacent Black river drainage basin for the supply of the Black River and Erie canals.

The Mohawk flows southward until it reaches the city of Rome, at which point it turns to the east, flowing across the state in a course a little south of east until it enters the Hudson at Cohoes, a few miles above Troy. It has a length by actual course of 140 to 145 miles, and a drainage area, measured at the mouth, of about 3,468 square miles, according to U. S. Geological Survey topographic maps.

The immediate valley of the Mohawk is broad and open, at many places a mile or two in width, from which there is a rise, usually gradual but sometimes abrupt, to hills which attain altitudes several hundred feet above the stream. Toward the mouth of the river the valley becomes more contracted and the meadows disappear. The flats which border the stream have a rich alluvial soil; the more elevated lands are covered with gravelly loam and clay.

Above Rome the Mohawk flows through a deep gorge in shale rock; from Rome eastward to Little Falls the valley is deeply filled with alluvial deposits, and the flood plains on either side become submerged during freshets, thus acting to some extent as storage reservoirs. At Little Falls the river cuts through a rocky gorge, whose walls rise precipitously 500 or 600 feet.

Below Rome the fall of the river is small and rather uniform, being made up of long quiet reaches with slight riffles; but at Little Falls this uniformity is broken, and the stream descends in a succession of falls about 45 feet in 2,500. The average fall between Rome and the lower aqueduct at Crescent, a distance of 110.7 miles, is 2.43 feet per mile; thence to the level of slack water above Troy dam there is a farther descent of 149.5 feet in 4.4 miles, but of this 105 feet is included within the improved power at Cohoes.

The principal tributaries of the Mohawk below the source are, successively, Oriskany, West Canada, East Canada and Schoharie creeks.

The Erie canal runs parallel to the Mohawk through most of its course below Rome and derives a part of its water-supply from the river. Feeder dams for purposes of diversion are located on the river at Delta, Rome, Little Falls, Rocky Rift and Rexford Flats. A dam at Oriskany creek also diverts into the canal a portion of the flow of that tributary, as well as waters brought into the Mohawk basin from storage reservoirs located in the upper drainage basin of Chenango river near Hamilton, N. Y. There is also a diversion dam near the mouth of Schoharie creek, the largest tributary of the Mohawk.

Drainage Areas of Mohawk River and Tributaries.

(From U. S. G. S. topographic maps.)

LIMITS.	AREA IN SQUARE MILES.			
	Place to place.	Sub-total.	Branch total.	Total.
Lansingkill.				
Source to junction with West branch	29.41	....	29.41	....
MOHAWK RIVER.				
Source of West branch to junction with East branch.	19.25	19.25	....	....
Source of East branch to junction with West branch	15.16	34.41	....	....
Junction of East and West branches to and including first large creek to North	5.86	40.27	....	....
First creek below junction to and including second large creek to North	6.08	46.35	....	....
Second creek below junction to junction of Lansing kill, Hillside	3.40	49.75	49.75	79.16
Junction at Hillside to mouth of Stringer brook	1.17	....	....	80.33
Stringer Brook.				
Source to mouth	13.43	....	13.43	93.76
MOHAWK RIVER.				
Junction of Stringer brook to mouth of Big brook (Frenchville)	3.02	....	....	96.78
Big Brook.				
Source to mouth	22.86	....	22.86	119.64
MOHAWK RIVER.				
Junction of Big brook (Frenchville) to State feeder dam at Delta	16.25	....	....	135.89
State feeder dam at Delta to highway bridge below new Delta dam	11.97	....	....	147.86
Highway bridge below new Delta dam to Ridge Mills dam	7.74	....	....	155.60
Ridge Mills dam to Floyd Ave. bridge	2.59	....	....	158.19
Floyd Ave. bridge to State dam at Rome	2.55	....	....	160.74
State dam at Rome, mouth of Six mile creek	26.40	....	....	187.14
Six-Mile Creek.				
Source to mouth	14.94	....	14.94	202.08
MOHAWK RIVER.				
Mouth of Six-Mile creek to mouth of Nine-Mile creek	5.29	....	....	207.37
Nine-Mile Creek.				
Source to South Trenton	19.62	....	....	....
South Trenton to crossing of 500-foot contour	6.54	26.16	....	....
Crossing of 500-foot contour to first bridge above Holland Patent	2.49	28.65	....	....
First bridge above Holland Patent to first bridge below Holland Patent	12.71	41.36	....	....
First bridge below Holland Patent to Stittville	6.12	47.48	....	....
Stittville to first bridge below Stittville (Powell's bridge)	11.59	59.07	....	....
Powell's bridge to third bridge below Stittville	10.34	69.41	....	....
Third bridge below Stittville to mouth	0.79	70.20	70.20	277.57
MOHAWK RIVER.				
Mouth of Nine-Mile creek to mouth of Oriskany creek	6.19	....	....	283.76
*Areas diverted from Chenango river basin.**				
Chenango river from source to junction with Eaton brook at Eaton	25.25	....	....	25.25
Eaton brook from source to Eaton reservoir dam	9.16	9.16	....	......
Eaton reservoir dam to junction with Chenango river at Eaton	6.69	15.85	15.85	41.10
Chenango river, junction Eaton brook to head of feeder canal	2.99	....	....	44.09

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* Not included in totals for Mohawk river areas.

Drainage Areas of Mohawk River and Tributaries — Continued.
From U. S. G. S. topographic maps.

LIMITS	AREA IN SQUARE MILES.			
	Place to place.	Sub-total.	Branch total.	Total.
Area diverted from Chenango river basin — Con.				
Bradley brook from source to Bradley reservoir dam	3.04	...	....	....
Bradley reservoir dam to head of feeder canal	4.57	7.61	....	....
Kingsley brook from source to Kingsley reservoir dam	5.12	.	....	....
Kingsley reservoir dam to junction with Bradley brook feeder canal	1.75	6.87	14.48	58.57
Head of feeder, Chenango river to junction of feeders, Woodman pond	2.94	....	....	60.61
Payne brook from source to Madison reservoir dam	8.73	....	....	....
Madison reservoir dam to junction of feeders, Woodman pond	2.04	10.77	10.77	71.38
Junction of feeders, Woodman pond to junction with Leland pond outlet	3.26	....	....	74.64
Source Leland creek to canal reservoir dam	6.74	....	....	81.38
Junction with Leland pond outlet to natural watershed limits	6.53	....	....	87.91
Oriskany Creek.				
Source of Oriskany creek to bridge at Solsville	7.84	..	....	....
Solsville to Oriskany Mills	13.27	21.11	....	....
Oriskany Mills to junction with Big creek, Deansboro	16.54	37.65	....	....
Source of Big creek to junction with Oriskany creek (Deansboro)	20.32	57.97	....	....
Junction with Big creek to Farmers Mills	14.09	72.06	....	....
Farmers Mills to Clinton	11.11	83.17	....	....
Clinton to Kirkland	4.73	87.90	....	....
Kirkland to dam above Clark Mills	5.76	93.66	....	....
Dam above Clark Mills to Walesville	9.92	103.58	....	....
Walesville to Colemans	36.99	140.57	....	....
Colemans to State dam above Oriskany	5.47	146.04	....	....
State dam above Oriskany to mouth of Oriskany creek	0.78	146.82	146.82	430.58
MOHAWK RIVER.				
Mouth of Oriskany creek to mouth of Sauquoit creek	15.68	....	....	446.26
Sauquoit Creek.				
Source of Sauquoit creek to Cassville	7.17	....	....	....
Cassville to dam at Clayville	4.71	11.88	....	....
Dam at Clayville to dam at Sauquoit	12.54	24.42	....	....
Dam at Sauquoit to dam above Chadwick	4.28	28.70	....	....
Dam above Chadwick to 700-foot contour at Willowvale	3.72	32.42	....	....
700-foot contour at Willowvale to dam at Washington Mills	11.37	43.79	....	....
Dam at Washington Mills to dam above New Hartford	2.92	46.71	....	....
Dam above New Hartford to dam at Capron	1.52	48.23	....	....
Dam at Capron to dam below Capron	2.20	50.43	....	....
Dam below Capron to upper dam at New York Mills	0.49	50.92	....	....
Upper dam at New York Mills to mouth of Sauquoit creek	14.58	65.50	65.50	511.76
MOHAWK RIVER.				
Mouth of Sauquoit creek to Black River R. R. bridge at Utica	13.09	....	....	524.85
Black River R. R. bridge at Utica to mouth of Reels creek	2.70	....	....	527.55
Reels Creek.				
Source to mouth	9.69	....	9.69	537.24
Ballou Creek.				
Source to mouth	4.57	....	4.57	541.81

Drainage Areas of Mohawk River and Tributaries—(Continued).
(From U. S. G. S. topographic maps.)

LIMITS.	AREA IN SQUARE MILES.			
	Place to place.	Sub-total.	Branch total.	Total.
MOHAWK RIVER.				
Mouth of Ballou creek to mouth of Starch Factory creek	1.99	....	....	543.80
Starch Factory Creek.				
Source to mouth	7.22	....	....	551.02
MOHAWK RIVER.				
Mouth of Starch Factory creek to mouth of Sterling creek	30.93	....	....	581.95
Sterling Creek.				
Source to mouth	19.94	....	....	601.89
MOHAWK RIVER.				
Mouth of Sterling creek to mouth of Moyer creek	14.85	....	....	616.74
Moyer Creek.				
Source to mouth	21.66	....	....	638.40
MOHAWK RIVER.				
Mouth of Moyer creek to mouth of Steels creek	7.30	....	....	645.70
Steels Creek.				
Source to mouth	29.54	....	....	674.24
MOHAWK RIVER.				
Mouth of Steels creek to Mohawk-Herkimer road bridge	33.07	....	....	707.31
Mohawk-Herkimer road bridge to mouth of West Canada creek	7.51	....	....	714.82
*West Canada Creek.**				
Source to mouth	583.64	....	....	1,298.46
MOHAWK RIVER.				
Mouth of West Canada creek to State dam at Little Falls	26.07	....	....	1,324.53
State dam at Little Falls to Gilberts dam	4.20	....	....	1,328.73
Gilberts dam to Rocky Rift feeder dam	11.82	....	....	1,340.55
Crum Creek.				
Source to mouth	11.40	....	....	1,351.95
MOHAWK RIVER.				
Mouth of Crum creek (feeder dam) to mouth Nowadaga creek	0.27	....	....	1,352.22
Nowadaga Creek.				
Source to mouth	32.43	....	....	1,384.65
MOHAWK RIVER.				
Mouth of Nowadaga creek to mouth of East Canada creek	4.65	....	....	1,389.30
*East Canada Creek.**				
Source to mouth	281.61	....	....	1,670.91
MOHAWK RIVER.				
Mouth of East Canada creek to mouth of East Crum creek	0.59	....	....	1,671.50
East Crum Creek.				
Source to mouth	15.55	....	....	1,687.05
MOHAWK RIVER.				
Mouth of East Crum creek to mouth of Timmerman creek	3.31	....	....	1,690.36
Timmerman Creek.				
Source to mouth	16.38	....	....	1,706.74

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* For subareas, see separate table.

Drainage Areas of Mohawk River and Tributaries—(Continued).
(From U. S. G. S. topographic maps.)

LIMITS.	Area in Square Miles.			
	Place to place.	Sub-total.	Branch total.	Total.
Mohawk River.				
Mouth of Timmerman creek to mouth of Zimmerman creek	0.52	....	....	1,707.26
Zimmerman Creek.				
Source to mouth	14.63	....	....	1,721.89
Mohawk River.				
Mouth of Zimmerman creek to St. Johnsville bridge	0.54	....	....	1,722.43
St. Johnsville bridge to mouth of Garoga creek	12.05	....	....	1,734.48
Garoga Creek.				
Source of Garoga creek to foot of East Garoga lake	10.44	....	....	....
Foot of East Garoga lake to foot of pond, Newkirk Mills	3.18	13.62	....	....
Foot of pond, Newkirk Mills to junction with Peck lake outlet	9.11	22.73	22.73	....
Source of Woodworth lake to foot of Peck lake	16.29	....	....	....
Foot of Peck lake to junction with Garoga creek	4.52	20.81	43.54	....
Junction with Peck lake outlet to Rockwood	7.20	....	50.74	....
Rockwood to Garoga	2.19	....	52.93	....
Garoga to mouth of Sprite creek	4.99	....	57.92	....
Source of Sprite creek to mouth	14.13	....	72.05	....
Mouth of Sprite creek to fourth highway bridge above mouth	13.19	....	85.24	....
Fourth highway bridge above mouth to second highway bridge above mouth	7.78	....	93.02	....
Second highway bridge above mouth to first highway bridge above mouth	1.17	....	94.19	....
First highway bridge above mouth to mouth of Garoga creek	0.51	....	94.70	1,829.18
Mohawk River.				
Mouth of Garoga creek to Fort Plain	12.70	....	....	1,841.88
Fort Plain to Canajoharie	67.92	....	....	1,909.80
Canajoharie Creek.				
Source to mouth	69.22	....	69.22	1,979.02
Mohawk River.				
Canajoharie to Sprakers	9.94	....	....	1,988.96
Flat Creek.				
Source to mouth	49.11	....	49.11	2,038.07
Mohawk River.				
Sprakers to mouth of Yatesville creek	17.56	....	....	2,055.63
Yatesville Creek.				
Source to mouth	12.71	....	12.71	2,068.34
Mohawk River.				
Mouth of Yatesville creek to mouth of Cayadutta creek	24.48	....	....	2,092.82
Cayadutta Creek.				
Source of Cayadutta creek to Johnstown (Main street bridge)	35.16	....	....	....
Johnstown (Main street bridge) to dam above Sammonsville	2.84	38.00	....	....
Dam above Sammonsville to dam at Sammonsville	3.53	41.53	....	....
Dam at Sammonsville to dam two miles below Sammonsville	16.44	57.97	....	....
Dam below Sammonsville to mouth of Cayadutta creek	5.06	63.03	63.03	2,155.85
Mohawk River.				
Mouth of Cayadutta creek to Fultonville bridge	0.68	....	....	2,156.53
Fultonville bridge to mouth of Schoharie creek	47.39	....	....	2,203.92

Drainage Areas of Mohawk River and Tributaries—(Concluded).
(From U. S. G. S. topographic maps.)

LIMITS.	AREA IN SQUARE MILES.			
	Place to place.	Sub-total.	Branch total.	Total.
*Schoharie Creek.**				
Source to mouth	909.30			3,113.22
MOHAWK RIVER.				
Mouth of Schoharie creek to mouth of Chuctanunda creek (Amsterdam)	31.54			3,144.76
South Chuctanunda Creek.				
Source to Minaville	22.62	22.62		
Minaville to mouth	10.41	33.03	33.03	3,177.79
North Chuctanunda Creek.				
Source to dam, Amsterdam reservoir	8.76	8.76		
Dam, Amsterdam reservoir to Hagaman	20.77	29.53		
Hagaman to Rockton	4.11	33.64		
Rockton to mouth	5.58	39.22	39.22	3,217.01
MOHAWK RIVER.				
Amsterdam to Hoffman Ferry	43.59			3,260.60
Hoffman Ferry to Scotia bridge	52.44			3,313.04
Scotia bridge to mouth of Alplaus kill	24.37			3,337.41
Alplaus Kill.				
Source to mouth	55.80		55.80	3,393.21
MOHAWK RIVER.				
Mouth of Alplaus kill to Rexford Flats dam	1.23			3,394.44
Rexford Flats dam to Vischer's Ferry dam	10.98			3,405.42
Vischer's Ferry dam to Dunsbach Ferry dam	53.20			3,458.62
Dunsbach Ferry dam to Crescent aqueduct	10.25			3,468.87
Crescent aqueduct to Crescent dam	2.68			3,471.55
Crescent dam to Cohoes Co.'s dam	0.61			3,472.16
Cohoes Co.'s dam to mouth of Mohawk river	12.68			3,484.84

* For subareas see separate table.

Table showing Drainage Areas heretofore used in estimating Run-off of Mohawk River and Tributaries at certain Gaging Stations; together with latest determination of these Areas from U. S. Geological Survey Topographic Maps.

STREAM.	Gaging station.	DRAINAGE AREAS IN SQUARE MILES.	
		Heretofore used.	From U. S. G. S. maps.
Mohawk river	Cohoes dam	3,456	3,472.2
	Dunsbach Ferry	3,440	3,458.6
	Rexford Flats	3,385	3,394.4
	Schenectady, Freemans bridge	3,321	
	Scotia bridge		3,313.0
	Amsterdam		3,217.0
	Tribes Hill		3,113.2
	Fonda-Fultonville		2,156.5
	Fort Plain		1,841.9
	Rocky Rift dam	1,351	1,340.6
	Little Falls	1,306	1,328.7
	Herkimer		707.3
	Utica, Black River R. R. bridge	500	524.8
	Rome, State dam	148 (1906)	160.0
	Floyd Ave. bridge		158.2
	Ridge Mills	152.5 (U. S. D. W.)	155.6
Schoharie creek	Fort Hunter	947	909.3
	Schoharie Falls	930	
	Middleburg		527.4
	Prattsville	243	238.4

Table showing Drainage Areas heretofore used in estimating Run-off of Mohawk River and Tributaries at certain Gaging Stations; together with latest determination of these Areas from U. S. Geological Survey Topographic Maps—(Continued).

STREAM.	Gaging station.	DRAINAGE AREAS IN SQUARE MILES.	
		Heretofore used.	From U. S. G. S. maps.
Cayadutta creek	**Near Johnstown**	40	**41.5**
Garoga creek	**Near Fort Plain**	80.8	....
East Canada creek	**Dolgeville**	256	....
West Canada creek	**Kast Bridge**	574 (1903)	**574.8**
	Poland	....	**470.1**
	Middleville	519 (U. S. D. W.)	**527.3**
	Trenton Falls	375	**375.8**
	Twin Rock bridge	364	**364.4**
Sauquoit creek	**New York Mills**	51.5	**50.9**
Oriskany creek	**State feeder dam**	144	**146.0**
Nine-Mile creek	**Stittville, Powell's bridge**	62.6	**59.1**

MOHAWK RIVER WATER-SURFACE ELEVATION RECORDS.

The following tables give records of the mean daily elevation of water-surface of the Mohawk river at different gaging stations for 1910. The elevations are referred to Barge canal datum, which is equivalent to mean tide at New York, taken as elevation 14.73 below the old grist mill bench-mark at Greenbush (Rensselaer).

The tables of elevations of water-surface are arranged in order proceeding up-stream from the junction of the Mohawk river with the Hudson river at Waterford, to Delta.

An accompanying table gives details as to the types of gages used, the datum of each and the manner in which they are read.

Water-surface Elevation Gages Maintained on Mohawk River and Tributaries During the Year 1910.

STREAM.	Location.	Date established.	Observer.	Elevation of zero mark (B. C. datum).	Type of gage.	Sub-division of gage.	Readings taken to	Usual Time of Reading. A. M.	Usual Time of Reading. P. M.
Mohawk river	Waterford	Jan. 15, 1907	Barge canal employee	0.00	Staff	1/10 Foot	1/10 Foot	7:30	5
" "	Cohoes	Dec., 1903	Wm. Butler	*153.47	Staff	1/10 Foot	1/10 Foot	6	6:30
" "	Dunsbach Ferry, Emerick	Mar. 12, 1898	Robert Wilson	†172.2	Staff	1/10 Foot	1/10 Foot	8	4
" "	Above dam, Rexford Flats	Dec. 8, 1898	J. Reepmeyer, Jr.	208.16	Chain	1/10 Foot	1/00 Foot	10	5
" "	Schenectady	April 3, 1904	Wm. C. Vrooman	208.66	Staff	1/10 Foot	1/10 Foot	8	6
" "	Tribes Hill	Jan. 7, 1904	R. L. Marshall	263.71	Chain	1/10 Foot	1/10 Foot	7	5
" "	Fultonville	April 29, 1906	Geo. J. Abel	270.00	Chain	1/10 Foot	1/10 Foot	7	7
" "	Canajoharie	Sept. 16, 1908	H. M. Hoag	282.45	Chain	1/10 Foot	1/10 Foot	7	5
" "	Fort Plain	Dec. 30, 1905	J. D. Hambreht	290.66	Chain	1/10 Foot	1/10 Foot	9	4
" "	Paper Co.'s tail-race, Little Falls	1898	C. V. Barrett, Supt.	320.64	Staff	1/10 Foot	1/10 Foot	7	5
" "	" " head-race, Little Falls	"	" " "	330.88	Staff	1/10 Foot	1/10 Foot	7	5
" "	Astoronga tail-race, Little Falls	"	John H. Schmeltz	317.53	Staff	1/10 Foot	1/10 Foot	7	5
" "	" head-race, Little Falls	"	" " "	333.17	Staff	1/10 Foot	1/10 Foot	7	5
" "	Above State dam, Little Falls	"	John Stark	360.31	Staff	1/10 Foot	1/10 Foot	8	4
" "	Herkimer	Nov. 23, 1904	Henry Edick, Jr.	377.43	Staff	1/10 Foot	1/10 Foot	7	6
" "	Utica	Mar. 15, 1905	W. E. Young	393.14	Staff	1/10 Foot	1/10 Foot	7	6
" "	Below dam, Rome	May 3, 1904	John Phillips	426.46	Staff	1/10 Foot	1/10 Foot	8	.....
" "	Above " "	" "	" "	430.00	Staff	1/10 Foot	1/10 Foot	8	.....
" "	Floyd Ave., Rome	July 9, 1907	G. G. Williams	445.01	Chain	1/10 Foot	1/10 Foot	7	5
" "	Below dam, Ridge Mills	May 3, 1904	Daniel Brown	454.79	Staff	1/10 Foot	1/10 Foot	7:30	.....
" "	Above " " "		" "	465.00	Staff	1/10 Foot	1/10 Foot	7	.....
" "	At lock 7, Delta	Aug. 20, 1905	E. A. Hurlbut	479.00	Staff	1/10 Foot	1/10 Foot	7	4
" "	Below dam, Delta	May 3, 1904	E. A. Evans	502.30	Staff	1/10 Foot	1/10 Foot	10	.....
" "	Above " Delta	" "	" "	507.55	Staff	1/10 Foot	1/10 Foot	10	.....
Schoharie creek	Fort Hunter	Sept. 24, 1898	Wm. J. Wick	277.50	Chain	1/10 Foot	1/10 Foot	8	5
" "	Central Bridge	April 3, 1904	A. M. Spencer	565.96	Chain	1/10 Foot	1/10 Foot	6:30	6:30
" "	Middleburgh	Aug. 24, 1906	Miss M. E. Wheeler	†	Staff	1/10 Foot	1/10 Foot	9	5
East Canada creek	Below dam, Dolgeville	1898	Godfrey Aman	†	Staff	1/10 Foot	5/100 Foot	7	.....
" " "	Above dam, "	1898	" "	†	Staff	1/10 Foot	5/100 Foot	7	6
West Canada creek	Kast Bridge	May 15, 1904	Lloyd Kast	414.24	Tape	1/100 Foot	1/100 Foot	8	4
" " "	Above dam, Middleville	July 28, 1908	Nelson Dedicke Felt Co.	†	Chain	1/10 Foot	1/10 Foot	A. M.	P. M.
" " "	Two tail-race gages, Middleville	" "	Nelson Dedicke Felt Co.	†	Staffs	1/10 Foot	1/10 Foot	"	"
" " "	Poland	July 3, 1908	Clarence H. Fitch	†	Chain	1/10 Foot	1/10 Foot	8	5
" " "	Morgan dam, Trenton Falls	Feb. 8, 1904	C. W. Young	*751.03 W. B.	Staff	1/10 Foot	1/10 Foot	7	6
" " "	Power Co.'s dam, Trenton Falls	Feb. 8, 1904	" "	1,009.56	Staff	Inch	Inch	8	5
" " "	Twin Rock bridge, Grant	Sept. 7, 1909	Frank McArthur	1,135.07	Tape	1/100 Foot	1/100 Foot	7	5
" " "	Near Wilmurt	June 28, 1909	Glen W. Flausburg	†	Chain	1/10 Foot	1/10 Foot	7	4
Nine-Mile creek	Stittville	Nov. 4, 1905	Mrs. Maria Powell	481.72	Chain	1/10 Foot	1/10 Foot	7	5

* Weather Bureau datum. † Arbitrary datum.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River at Waterford, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	13 20	15.95	23.30	21.00	16.20	16.55	14.00	15.20	15.15	16.65	16.05	15.60
2.....	14.30	15.25	24.20	19.75	16.00	16.55	14.00	15.05	15.20	16.40	16.15	15.60
3.....	14.55	15.20	24.00	19.15	16.00	16.20	13.95	15.00	15.20	16.05	16.05	15.65
4.....	14.55	16.90	22.60	18.60	16.00	16.05	13.95	15.15	15.50	15.70	16.25	15.70
5.....	12.85	15.75	21.75	18.05	16.85	15.85	13.90	15.15	15.35	15.45	16.35	15.55
6.....	13.00	15.15	20.25	17.60	16.63	15.75	13.85	15.15	15.25	15.35	16.45	15.50
7.....	15.00	15.05	20.50	17.50	16.20	16.20	13.80	15.35	15.35	15.70	17.05	15.35
8.....	15.15	14.95	21.80	17.75	15.85	17.05	13.80	15.50	15.40	15.55	17.30	15.20
9.....	15.35	14.80	19.75	17.40	15.65	17.40	13.80	15.30	15.35	15.90	17.05	15.05
10.....	15.40	14.80	18.80	17.00	15.60	16.80	13.70	15.00	15.85	15.70	16.85	14.95
11.....	15.30	14.75	17.90	16.55	15.45	16.50	13.75	15.10	15.80	15.50	16.55	15.25
12.....	15.10	14.65	17.50	16.25	15.20	16.80	14.25	15.10	15.70	15.15	16.65	15.00
13.....	15.15	14.50	17.40	16.35	15.05	16.95	13.80	15.80	15.65	14.80	16.70	13.40
14.....	15.10	14.55	17.40	16.10	14.80	16.55	14.55	15.90	15.40	14.55	16.50	12.65
15.....	15.25	14.65	17.00	15.70	14.80	16.05	14.85	15.45	15.10	14.75	16.20	13.20
16.....	15.50	14.55	16.45	15.50	14.80	15.75	14.80	15.35	15.00	14.80	16.05	14.50
17.....	15.40	14.60	16.10	15.45	14.60	15.50	15.05	15.15	15.10	14.35	16.00	14.65
18.....	15.20	14.70	15.75	15.40	14.60	15.55	15.30	15.05	15.20	14.05	16.05	15.10
19.....	15.45	14.75	15.60	15.90	14.50	15.80	15.20	15.05	15.15	13.80	16.00	15.05
20.....	15.85	14.85	15.90	17.20	14.60	16.05	15.15	15.05	14.80	14.75	16.05	15.00
21.....	16.00	14.75	17.30	17.35	15.10	15.45	15.25	15.35	14.65	14.85	15.85	14.85
22.....	20.76	15.05	17.30	16.75	15.40	15.25	15.25	15.35	14.70	15.00	15.70	14.10
23.....	20.10	16.05	17.35	16.25	15.50	15.00	15.30	15.20	14.85	15.50	15.85	14.25
24.....	18.15	15.80	17.65	16.00	15.20	14.75	15.20	15.10	15.00	15.25	15.95	14.95
25.....	17.40	15.55	18.25	15.80	15.20	14.55	15.20	15.05	15.30	15.10	15.75	15.50
26.....	16.75	15.25	20.05	16.10	16.40	14.50	15.10	14.95	15.05	15.50	15.85	15.65
27.....	16.30	15.40	19.85	19.55	17.15	14.35	15.10	14.95	15.05	15.25	16.05	15.75
28.....	15.95	20.62	19.30	18.20	16.70	14.25	15.20	15.10	15.55	15.45	15.90	15.60
29.....	15.55	......	19.05	17.20	16.25	14.10	15.05	14.80	16.60	15.65	15.80	15.65
30.....	15.35	......	19.20	16.40	16.05	14.00	15.10	14.90	16.90	15.85	15.75	15.80
31.....	15.15	......	19.80	......	16.35	......	15.30	14.85	......	16.11	......	15.75

Mean Daily Elevation of Water-surface (U. S. Weather Bureau Datum) of Mohawk River above Dam at Cohoes, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec. *a*
1910.												
1......	154.02	154.97	158.72	156.47	155.67	155.37	154.37	157.17	155.12	157.82	157.52	......
2......	154.57	154.97	159.07	156.37	155.22	155.27	154.42	156.92	155.07	157.62	157.27	......
3......	153.85	155.12	158.92	156.27	155.22	155.12	154.52	156.52	156.42	157.52	157.52	......
4......	153.55	154.92	158.17	155.82	155.42	155.07	154.57	156.27	157.37	157.42	157.37	......
5......	153.12	154.82	157.82	155.57	155.77	155.17	154.22	155.67	157.47	157.37	157.57	......
6......	153.32	154.97	157.42	155.57	155.62	155.67	154.22	156.72	157.32	157.27	158.07	......
7......	153.68	154.92	157.32	155.57	155.37	156.52	154.17	157.42	157.52	157.12	158.12	......
8......	154.62	154.22	158.27	155.82	155.32	156.42	154.12	157.52	157.67	157.22	157.92	......
9......	155.02	154.52	157.02	155.72	155.02	156.02	153.97	157.32	157.62	157.17	157.87	......
10......	155.12	154.77	156.72	155.77	154.87	156.02	154.47	157.22	157.37	157.52	158.07	......
11......	154 52	154.77	156.17	155.22	154.87	155.42	154.22	157.17	157.52	157.27	*a*	......
12......	154.52	154.87	156.07	155.17	154.82	155.97	154.17	157.32	157.17	157.22	*a*	......
13......	154.47	155.07	156.07	155.27	154.77	155.97	154.17	157.77	155.67	157.07	*a*	......
14......	154 32	154.77	155.97	155.32	154.82	155.67	154.42	157.67	155.62	157.02	*a*	......
15......	154.47	154.82	155.82	155.12	154.87	155.32	153.84	157.37	155.52	156.77	*a*	......
16......	154.77	154.92	155.47	154.97	154.62	155.15	154.47	157.12	155.52	157.22	*a*	......
17......	154.32	154.97	155.32	155.07	154.57	155.17	157.22	156.82	157.07	157.42	*a*	......
18......	154.42	155.07	155.27	154.97	154.52	155.27	155.28	156.02	157.12	156.37	*a*	......
19......	154 37	155.17	155.32	155.05	154.57	155.92	156.32	155.42	155.57	155.92	*a*	......
20......	154.57	155.47	155.67	156.07	154.87	155.72	156.32	154.97	155.17	155.72	*a*	......
21......	155.17	155.37	156.37	156.07	155.17	155.42	155.72	157.27	155.12	155.77	*a*	......
22......	156.30	155.47	156.42	155.62	155.52	155.22	155.67	157.27	154.87	155.82	*a*	......
23......	158.02	155.62	156.32	155.32	155.32	154.92	156.22	157.37	154.65	157.07	*a*	......
24......	156.77	155.62	156.37	155.37	155.07	154.87	157.27	157.37	154.12	157.32	*a*	......
25......	156.42	155.37	156.67	155.02	155.02	154.92	156.42	157.37	155.24	156.42	*a*	......
26......	155.97	155.37	157.27	155.52	156.17	154.97	156.47	157.27	154.99	156.32	*a*	......
27......	155.72	155.37	157.02	157.37	156.12	154.42	156.87	157.27	155.87	156.87	*a*	......
28......	155.62	155.97	156.57	156.42	155.92	154.47	156.77	157.02	157.87	156.92	*a*	......
29......	155.42	......	156.32	155.82	156.32	154.52	156.77	155.42	158.22	157.02	*a*	......
30......	155.47	......	156.42	155.62	156.17	154.52	157.42	155.52	158.32	157.57	*a*	......
31......	155.42	......	156.47	......	155.37	......	157.47	155.37	......	157.32	......	......

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a No record.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River at Dunsbach Ferry, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	174.43	175.38	*c*	177.35	175.88	175.98	174.53	174.53	174.13	175.23	175.13	174.98
2......	174.33	175.23	*c*	177.40	175.68	175.88	174.58	174.53	174.13	175.03	174.98	174.93
3......	174.33	175.23	*c*	177.30	175.83	175.68	174.53	174.43	174.13	174.93	174.83	174.88
4......	174.33	175.13	*c*	177.08	176.13	175.53	174.53	174.38	174.38	174.73	174.73	174.83
5......	174.43	175.03	*c*	176.53	176.78	175.63	174.53	174.33	174.53	174.63	175.13	174.73
6......	174.48	175.03	180.45	176.43	176.38	176.13	174.48	174.53	174.68	174.53	175.73	174.73
7......	174.63	174.93	179.00	176.23	175.98	177.45	174.43	175.13	174.83	174.43	175.88	174.73
8......	174.63	174.88	179.70	176.23	175.68	177.40	174.43	174.98	175.38	174.68	175.83	174.68
9......	174.88	174.88	179.10	176.08	175.48	177.08	174.43	174.68	175.78	175.03	175.63	174.63
10......	175.13	174.93	178.70	176.03	175.43	176.48	174.43	174.63	175.53	174.93	175.78	174.53
11......	174.98	174.93	178.10	175.98	175.43	176.13	174.43	174.58	175.08	174.73	176.18	174.43
12......	174.88	174.93	177.60	175.98	175.38	176.58	174.48	174.58	174.68	174.63	176.38	174.38
13......	174.83	174.93	177.08	176.08	175.28	176.98	174.43	175.48	174.48	174.53	176.13	174.38
14......	174.83	174.93	176.78	175.93	175.18	176.53	174.43	175.48	174.43	174.53	175.73	174.43
15......	174.73	174.88	176.63	175.68	174.98	175.88	174.43	175.13	174.43	174.43	175.53	174.48
16......	174.73	174.83	176.38	175.48	174.93	175.68	174.43	174.83	174.33	174.38	175.38	174.53
17......	174.73	174.78	176.18	175.43	174.93	175.53	174.33	174.58	174.33	174.33	175.23	174.43
18......	174.73	175.18	176.03	175.38	174.93	175.98	174.33	174.53	174.28	174.28	175.18	174.48
19......	174.93	175.23	175.88	175.88	175.03	176.63	174.28	174.48	174.23	174.28	175.03	174.53
20......	175.43	175.23	175.68	176.88	175.23	176.38	174.23	174.43	174.23	174.38	174.88	174.43
21......	175.88	175.23	175.98	176.48	175.53	175.88	174.33	174.38	174.23	174.48	174.73	174.43
22......	176.98	175.53	177.30	176.28	175.33	175.63	174.33	174.28	174.23	174.53	174.78	174.43
23......	181.60	176.13	177.20	175.98	175.43	175.35	174.33	174.23	174.13	174.58	174.93	174.48
24......	178.10	175.78	177.20	175.73	175.68	175.08	174.33	174.23	174.13	174.73	175.03	174.58
25......	177.45	175.63	177.50	175.63	175.63	175.03	174.33	174.18	174.18	174.83	175.13	174.73
26......	177.13	175.67	178.55	175.93	177.03	174.93	174.38	174.23	174.28	174.93	175.13	174.83
27......	176.73	175.78	178.20	178.90	176.68	174.93	174.43	174.23	174.68	175.03	175.13	174.93
28......	176.23	176.48	177.60	177.15	176.23	174.78	174.43	174.23	175.23	175.18	175.13	174.93
29......	175.98	......	177.30	176.63	175.93	174.68	174.43	174.23	175.38	175.38	175.03	175.03
30......	175.73	......	177.25	176.13	175.68	174.58	174.53	174.23	175.28	175.38	175.03	175.13
31......	175.48	......	177.35	......	175.93	......	174.63	174.23	......	175.28	......	175.48

c Ice obstruction; no record.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River above Dam at Rexford Flats, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	209.96	209.96	*a*	*a*	210.31	210.36	208.96	209.84	209.64	210.49	209.89	209.94
2......	209.96	209.96	*a*	*a*	210.13	210.26	208.96	209.84	209.64	210.09	209.84	209.94
3......	209.96	209.96	*a*	*a*	210.16	210.31	208.96	209.74	209.64	209.89	209.94	209.94
4......	210.06	209.86	*a*	*a*	210.46	210.11	208.96	209.74	209.69	209.79	209.94	209.94
5......	210.06	209.86	*a*	*a*	211.01	210.01	208.86	209.74	209.79	209.66	210.19	209.94
6......	210.06	209.86	*a*	*a*	210.66	211.06	208.86	209.84	209.99	209.59	210.24	209.94
7......	209.96	209.86	*a*	*a*	210.16	211.76	208.76	209.84	210.04	209.54	210.24	209.94
8......	209.96	209.86	*a*	*a*	209.96	211.31	208.76	209.84	210.04	209.64	210.34	209.94
9......	209.96	209.86	*a*	*a*	209.86	210.91	208.91	209.84	210.04	209.74	210.49	209.94
10......	209.96	209.86	*a*	*a*	209.76	210.41	209.66	209.94	210.04	209.74	210.54	209.94
11......	209.96	209.86	*a*	*a*	209.76	210.36	209.96	210.09	209.94	209.69	210.54	209.94
12......	209.96	209.86	*a*	*a*	209.66	210.71	209.96	210.14	209.84	209.64	210.79	209.94
13......	209.96	209.86	*a*	*a*	209.56	211.01	209.96	*a*	209.79	209.54	210.74	209.94
14......	209.96	209.86	*a*	*a*	209.46	210.66	209.96	*a*	209.84	209.54	210.54	209.94
15......	209.96	209.86	*a*	*a*	209.41	210.11	209.96	210.14	209.74	209.54	210.44	209.94
16......	210.06	209.86	*a*	*a*	209.36	210.06	209.99	210.14	209.74	209.54	210.34	209.94
17......	210.06	209.86	*a*	*a*	209.26	210.01	209.89	210.09	209.74	209.54	210.19	209.94
18......	210.06	209.86	*a*	*a*	209.26	210.71	209.74	210.04	*a*	209.54	210.09	209.94
19......	210.06	209.86	*a*	*a*	209.26	210.91	209.74	210.04	*a*	209.54	209.99	209.94
20......	210.16	209.86	*a*	*a*	209.26	210.66	209.69	210.04	*a*	209.54	209.84	209.94
21......	210.21	209.86	*a*	*a*	209.61	210.51	209.64	210.04	*a*	209.54	209.79	209.94
22......	212.41	209.86	*a*	*a*	209.81	210.21	209.64	209.99	*a*	209.54	210.09	209.94
23......	213.41	210.06	*a*	*a*	210.31	209.71	209.64	209.89	*a*	209.54	210.49	209.94
24......	212.21	210.13	*a*	*a*	210.06	209.46	209.64	209.84	209.64	209.64	210.29	209.94
25......	211.61	210.16	*a*	*a*	209.86	209.36	209.69	209.84	209.64	209.64	210.14	209.94
26......	211.16	210.16	*a*	*a*	211.41	209.36	209.74	209.84	209.72	209.64	210.04	209.94
27......	210.56	210.06	*a*	212.81	211.16	209.26	209.74	209.79	210.39	209.64	209.94	209.94
28......	210.31	211.86	*a*	211.56	210.81	209.26	209.79	209.74	210.94	209.64	209.94	209.94
29......	210.21	......	*a*	210.91	210.61	209.21	209.74	209.66	211.34	209.74	209.84	209.94
30......	210.06	......	*a*	210.51	210.36	208.25	209.74	209.64	210.94	210.29	209.94	209.94
31......	210.06	......	*a*	......	210.36	......	209.64	209.64	......	210.09	......	209.94

a No record.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River at Schenectady, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	209.76	210.06	223.59	213.81	210.81	210.91	209.41	210.16	209.86	210.96	210.11	210.06
2......	209.76	210.06	222.33	213.46	210.76	210.81	209.36	210.06	209.86	210.41	209.91	210.16
3......	209.76	210.06	221.56	212.81	210.81	210.46	209.36	209.96	209.86	210.26	209.86	209.91
4......	209.76	210.06	219.11	211.96	211.56	210.16	209.26	209.96	210.16	210.11	210.01	209.86
5......	209.76	210.06	216.91	211.76	211.96	210.06	209.26	209.96	210.16	209.91	210.51	209.86
6......	209.76	210.06	216.31	211.56	211.56	212.31	209.16	210.61	210.21	209.86	211.51	209.86
7......	209.96	210.06	217.91	211.76	210.61	213.56	219.16	210.71	210.66	209.76	211.41	209.86
8......	209.96	210.06	217.31	212.01	210.41	213.06	209.16	210.51	210.96	209.76	211.06	209.86
9......	210.16	210.06	215.16	211.56	210.01	212.16	209.41	210.36	210.71	210.21	210.71	209.86
10......	210.16	210.06	214.06	211.06	210.06	211.31	209.76	210.26	210.51	210.96	210.86	209.86
11......	210.16	210.06	212.86	210.61	210.06	211.06	209.96	210.26	210.51	210.91	212.36	209.86
12......	210.16	210.06	212.41	210.61	210.06	212.86	210.06	210.86	210.26	209.76	212.26	209.86
13......	210.16	210.06	212.31	211.06	209.86	212.16	209.96	211.11	209.96	209.76	211.56	209.86
14......	210.16	210.06	212.51	210.66	209.71	211.31	209.96	210.76	210.11	209.76	210.96	209.86
15......	210.16	210.06	212.06	210.51	209.66	210.71	209.96	210.56	210.11	209.76	210.66	209.86
16......	210.16	210.06	211.81	210.21	209.56	210.46	209.86	210.26	209.96	209.66	210.56	209.86
17......	210.16	210.06	211.11	210.16	209.46	210.41	209.86	210.16	210.06	209.56	210.41	209.86
18......	210.16	210.06	210.81	210.16	209.51	210.71	209.86	210.06	210.06	209.56	210.31	209.86
19......	210.16	210.06	210.76	211.56	209.56	211.91	209.96	209.96	209.91	209.46	210.16	209.86
20......	210.16	210.06	211.81	212.46	210.26	211.51	209.86	209.86	209.86	209.51	209.96	209.86
21......	211.01	210.06	213.61	210.96	210.36	210.71	209.86	209.96	209.86	209.46	209.96	209.86
22......	215.08	210.06	213.41	210.36	211.06	210.26	209.86	210.16	209.86	209.56	210.16	209.86
23......	216.16	210.06	213.56	209.96	210.81	210.01	209.76	210.06	209.86	209.56	210.16	209.86
24......	214.16	210.06	213.56	210.46	210.36	209.91	209.76	209.96	209.86	209.56	210.16	209.86
25......	213.11	210.06	214.66	210.41	210.41	209.66	209.96	209.96	209.86	209.56	210.16	209.86
26......	212.56	210.06	215.66	213.06	213.41	209.56	209.96	209.86	210.01	209.66	210.41	209.86
27......	212.01	210.06	214.56	215.11	212.46	209.56	209.96	209.86	210.16	209.86	210.36	209.86
28......	211.41	215.30	213.66	212.91	211.46	209.56	209.96	209.86	211.16	210.21	210.36	209.86
29......	210.86	......	213.56	211.81	210.76	209.56	209.96	209.86	212.46	210.56	210.16	209.96
30......	210.11	......	213.61	211.21	210.31	209.56	210.61	209.86	211.91	210.51	210.01	210.06
31......	210.06	......	213.71	......	210.86	......	210.31	209.86	......	210.36	......	210.66

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River at Tribes Hill, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	268.75	*a*	*a*	272.15	269.85	269.75	268.00	267.95	267.51	268.86	268.51	268.51
2......	268.75	*a*	*a*	271.80	270.15	269.40	267.90	267.75	267.51	268.51	268.36	268.36
3......	268.75	*a*	*a*	271.50	270.30	269.25	267.80	267.71	267.51	268.31	268.31	268.31
4......	268.65	*a*	*a*	271.45	270.90	269.10	267.75	267.91	268.01	268.01	268.16	268.36
5......	268.55	*a*	*a*	271.15	270.50	269.25	267.80	267.91	268.01	268.01	268.71	268.16
6......	268.55	*a*	*a*	270.90	270.25	271.60	267.80	269.06	268.31	268.01	269.61	268.11
7......	268.50	*a*	*a*	270.95	269.95	271.90	267.80	268.61	268.91	268.01	269.81	268.06
8......	268.85	*b*	*a*	270.90	269.70	271.60	267.70	268.21	268.96	268.26	269.51	268.11
9......	269.20	*b*	*a*	270.60	269.75	270.75	267.85	268.11	268.71	268.46	269.26	268.01
10......	269.40	*b*	271.20	270.35	269.80	270.00	268.00	268.06	268.01	268.41	269.71	268.11
11......	269.55	*b*	271.00	270.25	269.90	270.10	267.85	268.26	267.66	268.31	270.66	267.91
12......	269.65	*b*	270.50	270.15	269.80	270.85	267.80	269.06	267.51	268.21	270.46	267.91
13......	269.75	*b*	270.65	269.90	269.75	270.60	268.05	268.91	267.51	267.91	270.11	267.81
14......	269.65	*b*	270.50	269.75	269.60	270.10	268.15	268.41	267.51	267.91	269.66	267.81
15......	269.50	*b*	270.00	269.70	269.20	269.65	268.00	268.06	267.56	267.81	269.51	267.81
16......	269.45	*b*	269.90	269.40	268.80	269.55	267.70	268.01	266.61	267.76	269.06	267.81
17......	269.45	*b*	269.45	269.10	268.40	269.40	267.70	267.91	267.86	267.51	268.91	267.91
18......	269.55	*b*	269.10	269.70	268.35	269.80	267.60	267.91	267.81	267.56	268.76	267.91
19......	269.65	*b*	269.40	270.40	268.85	270.65	267.60	267.81	267.71	267.51	268.71	267.91
20......	270.75	*b*	270.25	271.25	269.25	270.10	267.70	267.81	267.51	267.51	268.46	267.91
21......	271.30	*b*	271.90	270.70	269.10	269.60	267.60	267.81	267.51	267.51	268.31	267.91
22......	271.95	*b*	271.40	269.95	269.35	269.20	267.60	267.71	267.51	267.61	268.21	267.91
23......	*a*	*b*	271.00	269.60	269.20	268.95	267.60	267.71	267.51	267.71	268.26	267.91
24......	*a*	*b*	271.95	269.35	269.25	268.60	267.60	267.66	267.51	267.81	268.21	268.11
25......	*a*	*b*	272.40	269.25	269.70	268.45	267.60	267.56	267.61	267.81	268.16	268.31
26......	*a*	*b*	273.05	272.20	271.75	268.30	267.75	267.51	268.21	268.01	268.46	268.26
27......	*a*	*b*	272.60	273.10	270.80	268.25	267.75	267.51	269.26	268.21	268.86	268.21
28......	*a*	*b*	272.10	271.10	270.45	268.25	267.80	267.51	269.96	268.66	268.86	268.16
29......	*a*	......	271.80	270.05	270.15	268.15	267.70	267.51	270.56	269.06	268.76	268.26
30......	*a*	......	271.70	269.90	269.75	268.00	268.50	267.51	270.16	268.81	268.71	268.31
31......	*a*	......	271.90	......	269.90	......	268.10	267.51	......	268.66	......	268.31

a No record; gage destroyed. *b* Record not available.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Schoharie Creek at Fort Hunter, N. Y

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	281.35	281.85	285.90	282.50	282.20	282.35	282.10	279.10	278.50	279.40	278.45	281.60
2......	281.25	282.00	285.30	282.30	282.10	282.20	281.95	279.10	278.50	279.65	278.60	281.65
3......	281.20	282.00	284.55	282.15	281.90	282.15	282.00	279.10	278.55	279.85	278.70	281.50
4......	281.35	281.95	283.80	281.90	282.35	282.00	281.95	279.15	278.40	279.45	278.85	281.55
5......	281.25	281.95	283.50	281.85	282.35	282.20	281.90	279.05	278.50	279.30	279.20	281.45
6......	281.85	281.95	283.60	281.95	282.30	282.50	281.70	278.95	279.50	279.20	279.20	281.20
7......	281.35	282.05	284.80	281.95	282.05	282.55	282.10	278.75	279.15	278.70	279.50	281.15
8......	281.25	282.20	284.00	282.45	282.10	282.25	281.40	278.90	279.40	278.60	280.35	281.15
9......	281.15	282.40	283.20	282.30	281.60	282.05	281.40	278.90	279.15	278.55	280.85	281.00
10......	281.20	282.55	282.90	282.10	281.85	281.75	281.40	278.90	278.90	278.50	281.35	281.05
11......	281.20	282.35	282.70	282.20	281.90	282.20	281.15	278.95	278.75	278.70	281.95	281.20
12......	281.25	282.25	282.60	282.20	281.85	283.00	280.95	278.70	278.60	278.70	282.55	281.05
13......	282.15	282.20	282.55	282.15	281.80	282.50	*a*	278.75	278.50	278.65	282.65	280.80
14......	282.20	282.20	282.55	282.10	281.75	282.10	*a*	278.75	278.50	278.60	282.60	280.75
15......	281.55	282.20	282.55	282.20	281.80	281.90	*a*	278.90	278.50	278.55	282.40	280.75
16......	281.25	282.35	282.45	281.95	281.70	281.70	*a*	278.90	280.95	278.60	282.25	280.55
17......	281.25	282.95	282.35	282.00	281.65	282.40	*a*	278.90	280.00	278.50	282.10	280.45
18......	281.35	282.95	282.15	282.65	281.60	282.85	*a*	278.90	280.75	278.40	281.95	280.45
19......	281.45	282.70	282.10	284.20	281.65	283.25	*a*	279.00	279.00	278.50	281.70	280.30
20......	282.65	282.60	282.85	283.20	281.70	282.90	*a*	278.90	278.60	278.55	281.65	280.05
21......	282.25	282.85	282.95	282.20	281.50	282.55	*a*	278.90	278.70	278.50	281.60	280.05
22......	286.80	283.95	282.70	282.10	281.65	282.20	*a*	278.90	278.65	278.60	281.55	279.90
23......	284.50	283.65	282.70	282.25	281.50	282.20	*a*	278.70	278.65	278.55	281.60	279.95
24......	283.40	282.65	283.05	282.10	281.50	282.25	*a*	278.50	278.55	278.50	281.65	279.75
25......	282.65	282.45	283.50	282.05	281.65	282.20	*a*	278.50	278.50	278.60	281.55	279.75
26......	283.20	282.40	283.60	285.25	281.75	282.15	*a*	278.50	278.65	278.60	281.75	279.60
27......	282.20	282.30	283.05	284.40	281.75	282.30	*a*	278.60	279.10	278.65	281.55	279.60
28......	281.80	290.33	282.70	283.60	281.75	282.20	*a*	278.50	279.25	278.70	281.65	279.95
29......	282.05	......	282.50	284.90	281.70	282.20	*a*	278.50	279.05	278.60	281.90	279.95
30......	282.00	......	282.65	282.30	281.95	282.10	*a*	278.50	279.65	278.60	281.85	279.95
31......	281.95	......	282.65	......	282.00	......	*a*	278.50	......	278.70	......	279.95

a No record.

Mean Daily Elevation of Water-surface of Schoharie Creek near Central Bridge, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	568.36	569.34	577.46	570.48	570.61	569.36	568.51	567.71	567.51	567.11	566.81	567.66
2......	568.36	569.38	575.86	570.18	570.36	569.41	568.31	567.71	567.51	567.06	566.84	567.66
3......	568.38	569.34	574.46	570.01	570.18	569.24	568.26	567.71	567.51	566.96	566.88	567.61
4......	568.44	569.36	573.26	569.94	570.11	569.04	568.21	567.71	567.64	566.91	567.06	567.61
5......	568.56	569.48	572.91	569.68	570.04	569.06	568.18	567.71	567.68	566.88	568.28	567.56
6......	568.81	569.71	574.46	569.54	569.86	570.46	568.14	567.68	567.81	566.84	568.91	567.56
7......	570.41	570.11	573.41	570.11	569.71	570.36	568.08	567.66	567.96	566.78	568.86	567.56
8......	571.46	570.28	571.94	570.54	569.56	569.94	568.04	567.66	567.96	566.76	568.56	567.56
9......	571.11	570.36	571.38	570.46	569.44	569.54	567.96	567.66	567.88	566.76	568.16	567.54
10......	571.06	570.01	570.88	570.34	569.34	569.66	567.88	567.68	567.84	566.76	568.34	567.51
11......	570.81	569.81	570.71	570.28	569.48	570.96	567.88	567.68	567.78	566.74	569.56	567.51
12......	570.71	569.64	570.51	570.21	569.44	570.81	567.86	567.68	566.76	566.71	569.06	567.56
13......	570.66	569.68	570.38	570.01	569.24	570.54	567.86	567.71	566.71	566.71	568.48	567.71
14......	570.51	569.74	570.24	569.81	569.16	570.18	567.84	567.74	566.81	566.64	568 24	567.61
15......	570.36	569.71	570.14	569.61	569.08	569.71	567.84	576.66	567.26	566.61	568.08	567.54
16......	570.31	569.71	569.98	569.48	569.04	569.68	567.81	567.58	567.18	566.58	567.94	567.61
17......	570.24	569.84	569.86	569.38	568.94	569.98	567.81	567.56	567.04	566.56	567.86	567.66
18......	570.16	570.56	569.68	569.31	568.86	571.46	567.81	567.58	566.86	566.54	567.78	567.64
19......	571.81	570.76	569.76	573.26	568.78	571.36	567.76	567.56	566.86	566.51	567.74	567.61
20......	572.56	570.66	570.24	571.01	568.68	570.46	567.76	567.56	566.84	566.48	567.66	567.58
21......	572.36	570.86	571.34	570.51	568.64	570.06	567.74	567.56	566.81	566.48	567.58	567.56
22......	582.66	576.91	571.08	570.21	568.64	569.68	567.71	567.56	566.81	566.54	567.54	567.56
23......	573.76	574.36	571.08	570.01	568.68	569.41	567.74	567.56	566.81	566.64	567.51	567.56
24......	571.91	573.56	571.36	569.81	568.71	569.24	567.71	567.56	566.78	566.66	567.56	567.76
25......	570.88	573.51	571.84	569.78	568.88	569.08	567.71	567.56	566.76	566.66	567.64	570.86
26......	570.28	573.04	572.36	579.53	569.56	568.94	567.68	567.58	566.88	566.71	567.64	570.26
27......	570.06	574.24	572.34	573.76	569.26	568.84	567.66	567.58	566.96	566.74	567.64	569.68
28......	569.76	582.31	571.34	572.16	569.04	568.81	567.78	567.56	566.96	566.76	567.66	569.56
29......	569.61	......	570.71	571.34	568.84	568.86	567.71	567.56	567.06	566.74	567.66	569.76
30......	569.46	......	570.64	570.86	568.96	568.68	567.71	567.56	567.16	566.76	567.66	574.66
31......	569.36	......	570.46	......	569.31	......	567.71	567.56	......	566.76	......	573.56

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River at Fultonville Bridge Fonda, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	275.32	276.80	290.18	280.13	275.76	276.36	274.04	274.14	273.64	277.45	275.10	274.95
2......	275.07	276.70	291.33	279.63	275.61	276.06	273.99	274.14	273 79	275.90	274.65	274.75
3......	274.72	276.55	286.58	278.78	275.76	275.76	273.94	273.94	273.84	274.70	274.50	274.50
4......	274.77	276.20	284.58	277.73	276.46	275.66	273.84	273.74	273.99	274.35	275.25	274.50
5......	274.82	275.95	282.88	277.38	276.36	276.26	273.84	274.54	274.14	273.95	276.15	274.50
6......	275.57	276.55	281.53	276.98	276.36	278.96	273.84	275.09	274.29	273.70	277.05	274.40
7......	275.92	277.10	282.78	277.03	275.76	279.41	273.94	274.59	274.59	273.10	276.50	274.50
8......	276.27	277.15	282.48	277.33	275.51	278.91	273.94	274.34	274.74	274.50	276.20	274.55
9......	276.37	277.20	280.48	277.18	275.26	277.71	273.94	274.09	275.10	274.90	276.80	274.55
10......	276.42	277.20	278.83	276.88	275.16	277.51	273.84	274.59	274.95	274.50	277.00	274.40
11......	276.42	277.15	278.18	276.18	275.01	277.11	273.89	275.99	274.50	274.30	277.75	274.50
12......	276.42	277.10	277.68	276.38	274.76	277.56	273.94	275.54	274.10	274.25	277.80	274.40
13......	276.32	277.10	277.43	276.18	274.51	277.21	273.99	274.79	273.95	274.20	276.80	274.90
14......	276.32	276.95	277.33	276.08	275.01	276.76	273.99	274.74	274.10	274.10	276.10	275.25
15......	276.27	277.10	276.78	275.08	274.36	275.81	273.89	274.34	274.00	274.10	275.90	275.35
16......	276.62	277.20	276.18	275.08	274.36	275.31	273.84	274.04	273.85	274.00	275.55	275.30
17......	276.42	277.30	276.13	275.08	274.36	275.36	273.84	273.99	273.80	274.00	275.60	275.30
18......	276.22	277.30	275.93	275.13	274.66	276.16	273.89	273.84	273.80	273.80	275.35	275.40
19......	276.72	277.30	275.88	275.58	274.86	276.51	273.89	273.79	273.95	273.80	275.20	275.40
20......	277.17	277.40	278.33	277.13	275.96	275.71	273.84	273.84	273.85	273.75	275.00	275.25
21......	277.62	277.70	278.83	277.13	276.36	275.36	273.74	273.79	273 80	274.05	275.30	275.20
22......	280.37	277.75	278.73	276.58	276.96	275.11	273.84	273.74	273.80	274.20	275.70	275.30
23......	283.37	278.15	278.88	275.78	276.56	274.21	273.84	273.74	273.85	274.35	275.10	275.30
24......	282.42	278.65	279.13	275.43	275.86	274.56	273.84	273.54	273.80	274.45	275.10	275.90
25......	281.92	278.50	280.13	275.28	276.96	274.36	273.79	273.79	274.05	274.50	275.20	275.95
26......	281.82	278.20	281.23	278.38	278.71	274.21	273.64	273.79	274.75	274.55	275.70	275.85
27......	281.47	279.00	280.68	278.63	278.61	274.21	273.89	273.74	275.10	275.10	275.50	275.80
28......	279.42	285.20	279.18	277.38	277.96	274.36	274.64	273.74	275.65	275.50	275.40	275.85
29......	278.22	......	279.28	276.63	277.16	274.31	275.34	273.74	276.10	275.90	275.45	275.90
30......	277.67	......	279.78	276.43	276.96	274.11	274.64	273.64	276.55	275.55	275.50	276.15
31......	277.12	......	280.08	......	276.81	......	274.24	273.64	......	275.40	......	276.10

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River at Canajoharie, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	285.65	287.65	301.55	292.30	287.10	287.75	285.20	285.05	284.10	286.95	286.10	285.40
2.....	285.55	287.55	302.80	291.30	287.05	287.35	285.15	284.95	284.55	286.45	286.05	285.05
3.....	285.65	287.40	300.40	290.15	287.35	287.05	284.95	284.70	284 80	286.20	286.05	284.85
4.....	285.55	287.20	297.85	289.20	289.50	286.65	284.75	284.60	285.05	285.85	286.70	284.65
5.....	285.55	287.25	294.90	289.15	289.00	286.50	284.80	285.95	285.80	285.50	287.80	284.60
6.....	285.85	287.10	293.05	288.50	288.05	290.45	284.75	286.80	286.25	285.35	288.30	284.45
7.....	286.40	287.20	295.15	289.35	287.35	291.10	284.85	286.15	286.95	285.75	287.90	284.30
8.....	286.75	287.25	293.65	288.85	286.90	290.20	284.95	286.00	286.55	286.55	287.35	284.15
9.....	286.75	287.40	292.45	288.75	286.75	289.00	284.95	285.55	285.80	286.20	287.05	284.35
10.....	286.75	287.45	290.65	287.75	286.65	287.80	284.95	285.30	285.40	285.75	288.05	284.35
11.....	286.70	287.30	289.60	287.55	286.45	288 20	284.95	286.20	284.95	285.50	289.45	284.55
12.....	286.65	287.50	288.85	287.70	286.30	288.70	285.15	287.60	284.65	285.35	288.75	284.65
13.....	286.45	287.30	288.75	287.60	286.10	288.55	285.20	286.70	284.60	285.15	288.00	284.75
14.....	286.40	287.25	288.90	287.20	285.90	287.65	284.80	286.15	284.55	285.05	287.40	284.85
15.....	286.35	287.25	288.40	286 85	285.90	287.05	284.65	285.50	284.60	284 95	287.10	284.65
16.....	286.30	287.30	287.85	286.60	285.80	286.70	284 65	285.10	284.80	285.00	287.00	284.55
17.....	286.25	287.65	287.50	286.65	285.50	286.65	284.95	284.70	284.60	284.70	286.75	284.75
18.....	286.30	287.90	287.30	286.80	285.55	288.10	284.75	284.60	284.45	284.75	286.50	284.70
19.....	287.15	287.95	287.30	288.70	286.95	288.25	284.70	284.65	284.30	284.85	286.35	284.68
20.....	288.35	287.80	289.40	289.20	287.60	287.60	284.45	284.95	284.05	284.80	285.95	284.70
21.....	288.70	287.90	290.40	288.60	287.85	286.80	284.40	285.20	283.95	284.90	286.15	284.85
22.....	291.80	289.05	290.20	287.95	288.55	286.35	284.45	284.70	284.00	284.90	286.10	285.15
23.....	293.90	289.65	290.60	287.25	287.70	286.00	284.55	284.60	284.05	285.15	286.05	285.10
24.....	292.90	289.30	290.80	286.85	287.10	285.90	284.75	284.40	284.00	285.50	286.45	285.20
25.....	292.30	289.10	292.30	286.75	289.40	285.65	284.85	284.40	284.40	285.95	286.65	285.65
26.....	291.20	288.90	293.35	289.25	291.10	285.35	285.00	284.45	286.25	285.80	286.45	285.85
27.....	290.20	289.00	292.05	289.60	289.75	285.35	284 80	284.50	287 60	286.45	286.15	285.70
28.....	289.35	297.40	291.25	288.90	288 40	285.60	285.15	284.45	288.25	287.15	285.65	285.50
29.....	288.30	......	291.40	287.85	287.50	285.35	286.70	284.40	289.70	287.65	285.70	285.75
30.....	287.85	......	292.00	287.50	287 10	284.85	285.95	284.20	288.25	286.95	285.70	287.40
31.....	287.85	......	291.95	......	288.05	...	285.40	284.10	......	286.45	.....	289.50

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River at Fort Plain, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	291.92	295.60	307.34	298.36	293.71	294.26	291.53	291.50	290.76	293.51	292.71	293.26
2.....	291.82	295.30	306.64	297.61	293.71	293.91	291.53	291.45	291.06	292.76	292.66	292.91
3.....	291.82	295.20	304.74	296.56	293.96	293.66	291.43	291.25	291.11	292.61	292.51	292.56
4.....	291.82	295.10	302.69	295.71	295.81	293.36	291.23	291.10	291.66	292.06	293.36	292.41
5.....	291.92	295.20	300.99	295.61	295.56	293.26	291.23	291.45	291.86	291.86	294.51	292.21
6.....	292.07	294.55	298.49	295.06	294.51	296.86	291.23	293.55	292.76	291.66	294.76	292.21
7.....	292.37	294.20	300.94	296.01	293.96	297.36	291.23	292.85	293.61	292.16	294.56	292.11
8.....	292.62	294.42	299.54	295.36	293.86	296.61	291.18	292.50	293.11	293.21	294.16	292.01
9.....	292.72	294.50	298.09	295.26	293.41	295.46	291.58	292.05	292.36	292.56	294.46	291.91
10.....	292.72	294.65	296.64	294.61	293.41	294.51	291.53	291.70	291.76	292.06	294.76	291.91
11.....	292.62	294.35	295.69	294.21	293.16	294.01	291.43	292.95	291.46	292.06	295.81	291.81
12.....	292.42	294.20	295.14	294.56	292.81	295.06	291.73	294.20	291.26	291.76	295.46	291.71
13.....	292.34	294.10	295.19	294.31	292.61	295.01	291.63	293.15	290.96	291.66	294.96	291.71
14.....	292.22	294.40	295.44	293.96	292.51	294.26	291.38	292.70	291.06	291.66	294.06	291.81
15.....	292.12	294.35	294.94	293.36	292.41	293.66	291.13	291.75	291.06	291.56	293.61	291.91
16.....	292.12	294.35	294.34	293.36	292.31	293.31	291.03	291.45	291.06	291.46	293.16	291.91
17.....	292.12	294.75	293.94	293.26	292.11	293.41	291.48	291.20	291.01	291.16	293.11	291.91
18.....	292.17	294.80	293.69	293.61	292.01	294.46	291.23	291.20	290.96	291.26	292.96	292.01
19.....	293.12	294.80	293.71	295.21	293.91	294.46	291.13	291.10	290.86	291.36	292.86	292.03
20.....	294.32	294.60	295.36	295.81	294.11	294.06	290.93	291.55	290.76	291.16	292.56	291.88
21.....	294.82	294.85	296.06	295.16	294.01	293.41	290.73	291.20	290.76	291.36	292.56	292.26
22.....	296.77	295.70	296.41	294.46	295.21	292.91	290.73	291.20	290.66	291.36	293.11	292.16
23.....	302.32	295.80	296.71	293.86	294.21	292.61	290.73	291.10	290.76	291.91	292.96	292.06
24.....	301.72	295.70	296.86	293.56	293.66	292.41	290.73	291.10	290.76	292.26	293.21	292.06
25.....	301.07	295.60	298.31	293.41	295.51	292.06	291.38	290.90	290.96	292.71	293.76	292.36
26.....	299.97	295.60	299.21	296.21	297.21	291.91	291.58	290.90	292.56	293.06	293.86	292.96
27.....	298.77	295.90	298.26	296.11	296.06	291.91	291.33	291.10	294.26	293.21	293.36	292.86
28.....	297.72	304.85	297.36	295.36	294.96	292.11	291.53	291.10	295.36	293.66	292.96	292.86
29.....	296.67	......	297.29	294.41	294.26	291.91	293.38	291.05	296.26	294.06	293.06	293.01
30.....	296.07	......	298.11	294.01	293.66	291.61	292.48	290.90	294.56	293.46	293.16	293.36
31.....	295.67	......	298.16	......	294.66	......	291.98	290.70	......	293.06	......	293.26

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River above State Dam at Little Falls, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	363.61	363.91	370.56	366.11	364.11	364.31	363.51	363.51	363.31	364.11	363.81	363.81
2.....	363.61	363.71	370.71	365.56	364.01	364.16	363.51	363.51	363.41	363.91	363.81	363.81
3.....	363.61	363.71	369.61	365.26	364.21	364.11	363.51	363.41	363.51	363.71	363.81	363.81
4.....	363.61	363.71	367.61	365.11	365.01	363.91	363.51	363.41	363.51	363.71	364.06	363.71
5.....	363.61	363.71	367.16	364.91	364.96	363.81	363.51	364.31	363.81	363.61	364.46	363.71
6.....	363.61	363.71	366.41	364.56	364.56	365.16	363.51	364.31	363.91	363.61	364.81	363.61
7.....	363.71	363.66	367.41	364.91	364.21	365.56	363.46	364.01	364.06	363.91	364.56	363.61
8.....	363.71	363.71	367.01	364.61	364.01	365.31	363.51	363.81	363.91	364.16	364.41	363.51
9.....	363.71	363.81	366.21	364.61	363.91	365.56	363.51	363.76	363.71	363.96	364.21	363.51
10.....	363.71	363.81	365.51	364.41	363.91	364.61	363.51	363.51	363.61	363.81	364.76	363.51
11.....	363.71	363.81	364.96	364.31	363.91	364.36	363.51	364.36	363.61	363.71	365.31	363.51
12.....	363.71	363.71	364.61	364.31	363.91	364.61	363.51	364.46	363.56	363.71	365.06	363.51
13.....	363.71	363.71	364.61	364.16	363.71	364.61	363.51	364.26	363.41	363.61	364.66	363.51
14.....	363.71	363.71	364.66	364.11	363.81	364.26	363.51	364.06	363.41	363.51	364.31	363.61
15.....	363.71	363.71	364.61	363.91	363.81	364.01	363.51	363.71	363.61	363.51	364.31	363.61
16.....	363.71	363.81	364.31	363.91	363.61	363.91	363.51	363.51	363.41	363.51	364.11	363.61
17.....	363.61	363.86	364.31	363.91	363.51	363.91	363.51	363.41	363.41	363.51	364.11	363.61
18.....	363.66	364.01	364.21	363.91	363.51	364.36	363.51	363.36	363.41	363.51	364.11	363.61
19.....	363.91	364.01	364.11	364.51	364.16	364.61	363.51	363.31	363.31	363.51	363.71	363.61
20.....	364.21	364.01	364.86	364.86	364.21	364.31	363.46	363.31	363.31	363.51	363.71	363.61
21.....	364.51	364.01	365.26	364.71	364.56	364.01	363.31	363.31	363.31	363.51	363.71	363.61
22.....	365.81	364.31	365.31	364.36	364.81	363.71	363.31	363.31	363.31	363.51	363.71	363.61
23.....	366.11	364.31	365.31	364.11	364.31	363.71	363.51	363.41	363.31	363.61	363.71	363.71
24.....	365.76	364.31	365.51	363.96	364.01	363.71	363.51	363.41	363.31	363.71	363.86	363.71
25.....	365.56	364.21	366.11	364.06	364.56	363.71	363.51	363.31	363.66	363.71	364.21	363.81
26.....	365.11	364.11	366.31	364.76	365.31	363.66	363.41	363.41	364.16	363.71	364.21	363.81
27.....	364.61	364.21	365.96	365.06	365.01	363.51	363.41	363.41	364.36	363.91	364.16	363.81
28.....	364.41	367.06	365.61	364.76	364.31	363.51	363.51	363.31	365.21	364.36	363.81	363.81
29.....	364.31	......	365.61	364.31	364.21	363.51	364.11	363.31	365.11	364.36	363.81	363.81
30.....	364.06	......	366.01	364.21	364.11	363.51	363.11	363.31	364.66	364.31	363.86	364.51
31.....	364.01	......	365.91	......	364.36	......	363.51	363.31	......	363.86	......	364.51

Mean Daily Elevation of Water-surface (Barge Canal Datum) of West Canada Creek at Kast Bridge, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	*a*	442.97	449.06	446.82	443.69	443.94	442.57	442.66	442.34	443.84	443.19	442.97
2.....	*a*	442.95	448.04	446.13	443.72	443.18	442.48	442.62	442.24	443.43	443.21	442.89
3.....	*a*	442.97	446.95	445.57	443.97	443.52	442.29	442.39	442.50	443.22	443.24	442.84
4.....	*a*	442.98	446.10	445.10	444.86	443.43	442.32	442.44	442.61	442.94	443.43	442.84
5.....	*a*	442.94	445.63	445.15	444.82	443.24	442.42	444.63	442.92	442.83	444.00	442.45
6.....	*a*	442.70	445.35	444.80	444.19	444.86	442.39	443.92	443.30	442.92	443.90	442.47
7.....	*a*	442.62	446.47	445.22	443.66	445.65	442.29	443.71	442.50	443.34	443.73	442.45
8.....	*a*	442.80	445.67	444.74	443.44	444.92	442.46	443.40	443.24	443.23	443.48	442.57
9.....	*a*	442.95	445.09	444.32	443.48	444.22	442.54	443.09	442.90	442.98	443.42	442.59
10.....	*a*	442.99	444.60	443.76	443.50	443.92	442.40	442.89	442.68	442.93	444.26	442.45
11.....	*a*	442.86	444.19	443.70	443.38	444.16	442.68	444.31	442.57	442.92	444.94	442.57
12.....	*a*	442.72	444.17	444.20	443.28	444.38	442.86	444.35	442.58	442.86	444.18	442.51
13.....	*a*	442.80	443.98	443.74	443.17	444.24	442.60	443.64	442.43	442.78	443.85	442.76
14.....	*a*	442.94	444.17	443.30	443.24	443.82	442.25	443.11	442.62	442.71	443.44	442.76
15.....	*a*	442.86	443.75	443.06	443.15	443.46	442.30	442.97	442.55	442.66	443.50	442.84
16.....	*a*	442.90	443.60	443.32	442.93	443.57	442.34	442.84	442.42	442.68	443.31	442.55
17.....	*a*	443.03	443.50	443.54	442.80	443.44	442.32	442.71	442.24	442.63	443.20	442.65
18.....	*a*	442.96	443.38	443.49	443.08	443.65	442.48	442.64	442.33	442.59	443.06	442.81
19.....	*a*	442.97	443.46	445.20	444.00	444.25	442.38	442.86	441.82	442.50	443.10	442.66
20.....	446.10	442.90	444.39	445.19	443.86	443.97	442.21	442.82	442.26	442.86	443.06	442.87
21.....	446.36	442.81	444.55	444.76	444.60	443.48	442.23	442.68	442.23	442.69	442.88	442.79
22.....	446.59	443.25	444.73	444.20	444.50	443.19	442.34	442.58	442.22	442.63	443.06	442.75
23.....	445.98	443.24	444.95	443.81	443.90	443.11	442.33	442.54	442.38	442.81	443.04	442.76
24.....	445.30	443.29	445.27	443.66	443.68	442.93	442.56	442.36	442.47	443.07	443.15	443.02
25.....	444.61	443.19	446.04	443.40	445.00	442.77	442.59	442.44	442.55	443.07	443.38	443.15
26.....	444.60	443.15	446.47	444.60	445.38	442.60	442.34	442.62	444.02	443.31	443.33	443.29
27.....	444.04	443.38	445.91	445.34	444.66	442.62	442.32	442.59	443.76	443.40	443.08	443.36
28.....	443.70	448.19	445.46	444.74	444.33	442.59	443.52	442.52	445.82	443.97	442.94	443.41
29.....	443.52	......	445.97	444.14	443.78	442.42	443.74	442.46	445.56	443.89	443.03	443.41
30.....	443.24	......	446.44	444.02	444.04	442.48	443.08	442.24	444.38	443.59	443.08	444.31
31.....	443.36	......	446.66	......	444.15	......	442.97	442.40	......	443.47	......	443.77

a No record.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of West Canada Creek at Trenton Falls, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	753.46	753.71	757.66	756.76	754.41	754.36	753.46	753.56	753.36	754.56	753.81	753.46
2.....	753.46	753.56	757.16	756.31	754.31	754.31	753.46	753.46	753.36	754.16	753.86	753.41
3.....	753.51	753.66	756.61	755.91	754.36	754.21	753.46	753.46	753.36	753.96	753.86	753.36
4.....	753.46	753.66	755.91	755.81	755.16	754.06	753.41	754.31	753.81	753.91	753.86	753.36
5.....	753.46	753.66	755.51	755.41	755.11	754.06	753.36	755.16	753.76	753.86	754.31	753.36
6.....	753.46	753.56	755.11	755.81	754.61	754.01	753.36	754.56	753.86	753.86	754.46	753.36
7.....	753.56	753.56	755.56	755.66	755.56	755.46	753.36	754.46	754.11	754.01	754.41	753.36
8.....	753.56	753.56	755.56	755.56	754.16	755.06	753.51	754.21	753.81	753.96	754.26	753.36
9.....	753.56	753.56	755.06	755.06	754.16	754.91	753.46	754.01	753.66	753.76	754.06	753.36
10.....	753.56	753.56	754.51	754.76	754.16	754.56	753.46	753.81	753.51	753.76	754.16	753.36
11.....	753.51	753.56	754.26	754.81	754.11	754.56	753.66	755.11	753.36	753.76	755.06	753.26
12.....	753.46	753.56	754.26	754.46	753.96	754.76	753.51	754.76	753.36	753.76	754.66	753.31
13.....	753.46	753.56	754.16	754.41	753.91	754.46	753.41	754.36	753.36	753.71	754.21	753.36
14.....	753.51	753.56	754.31	753.96	754.01	754.36	753.36	754.11	753.36	753.66	754.01	753.36
15.....	753.46	753.51	754.11	754.01	753.96	754.21	753.36	753.66	753.36	753.66	754.06	753.36
16.....	753.46	753.56	753.96	754.16	753.81	754.16	753.36	753 61	753.36	753.66	753.91	753.26
17.....	753.41	753.51	753.96	754.16	753.66	754.16	753.41	753.56	753.36	753.66	753.81	753.26
18.....	753.46	753.56	753.91	754.36	753.81	754.41	753.46	753.51	753.36	753.56	753.71	753.26
19.....	753.71	753.56	753.96	755.96	754.66	754.56	753.36	753.51	753.36	753.76	753.66	753.26
20.....	754.16	753.56	754.06	756.01	754.36	754.31	753.36	753.56	753.36	753.76	753.66	753.26
21.....	754.41	753.66	754.46	755.56	754.66	754.11	753.36	753.46	753.36	753.61	753.56	753.26
22.....	755.06	753.76	754.71	754.71	754.91	754.01	753.36	753.46	753.36	753.56	753.66	753.26
23.....	755.51	753.76	754.91	754.41	754.61	753.91	753.51	753.36	753.36	753.76	753.66	753.31
24.....	755.16	753.66	755.16	754.31	754.31	753.71	753.41	753.46	753.36	753.76	753.76	753.56
25.....	754.91	753.66	755.81	754.11	754.81	753.66	753.56	753.46	753.41	753.71	753.76	753.66
26.....	754.46	753.66	756.61	754.91	755.41	753.61	753.51	753.41	754.41	754.06	753.66	753.66
27.....	754.31	753.71	755.86	755.66	755.06	753.56	753.46	753.36	754.21	754.31	753.66	753.66
28.....	754.21	756.56	755.56	755.11	754.66	753.56	754.61	753.36	756.11	754.81	753.61	753.66
29.....	754.06	......	756.16	754.81	754.31	753.56	754.36	753.36	755.76	754.56	753.61	753.66
30.....	753.96	......	756.46	754.66	754.41	753.56	754.16	753.36	754.81	754.31	753.56	754.01
31.....	753.86	......	756.71	......	754.61	......	753.76	753.36	......	754.06	......	754.26

Mean Daily Elevation of Water-surface (Barge Canal Datum) of West Canada Creek above Power Dam at Trenton Falls, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	1,017.27	1,017.64	1,023.14	1,021.68	1,018.68	1,018.64	1,013.39	1,019.31	1,003.85	1,019.81	1,019.64	1,019.27
2	1,019.73	1,017.68	1,022.35	1,020.89	1,018.48	1,018.44	1,014.31	1,016.27	1,009.31	1,019.98	1,019.56	1,018.14
3	1,017.73	1,017.77	1,021.44	1,020.73	1,018.60	1,018.23	1,019.35	1,016.94	1,014.56	1,019.44	1,019.77	1,018.89
4	1,017.64	1,017.64	1,020.64	1,020.42	1,019.60	1,018.10	1,019.39	1,019.85	1,019.85	1,019.35	1,019.81	1,019.39
5	1,011.60	1,017.73	1,020.18	1,019.89	1,019.60	1,018.39	1,013.48	1,020.85	1,019.68	1,019.31	1,020.02	1,015.85
6	1,014.10	1,017.89	1,020.06	1,020.44	1,018.81	1,019.44	1,006.23	1,020.35	1,019.64	1,019.31	1,020.27	1,013.56
7	1,017.60	1,016.43	1,020.14	1,020.14	1,018.60	1,019.98	1,015.60	1,020.35	1,019.89	1,019.52	1,020.02	1,009.35
8	1,018.23	1,017.18	1,020.27	1,020.35	1,018.60	1,019.52	1,018.39	1,019.85	1,019.64	1,019.56	1,019.85	1,017.60
9	1,019.39	1,017.52	1,019.73	1,019.35	1,018.23	1,018.94	1,018.68	1,019.60	1,019.48	1,019.77	1,019.81	1,014.98
10	1,017.44	1,017.56	1,019.35	1,019.39	1,018.18	1,018.68	1,019.48	1,019.60	1,019.27	1,019.35	1,019.85	1,016.68
11	1,017.39	1,016.81	1,018.89	1,018.94	1,018.10	1,018.89	1,019.56	1,020.73	1,019.48	1,019.31	1,020.73	1,018.81
12	1,017.06	1,017.60	1,018.77	1,019.02	1,018.06	1,019.10	1,018.98	1,020.56	1,015.39	1,019.27	1,020.35	1,018.06
13	1,015.73	1,018.39	1,018.98	1,018.73	1,017.89	1,018.77	1,013.52	1,020.27	1,016.35	1,019.23	1,020.14	1,017.64
14	1,015.35	1,017.39	1,018.64	1,018.27	1,018.02	1,018.39	1,015.31	1,019.98	1,014.27	1,019.18	1,019.81	1,017.68
15	1,015.06	1,017.18	1,018.31	1,018.02	1,018.06	1,018.14	1,013.98	1,019.56	1,014.44	1,018.56	1,019.77	1,015.85
16	1,015.48	1,017.68	1,018.14	1,018.31	1,017.64	1,018.27	1,015.81	1,019.35	1,009.60	1,019.39	1,019.69	1,017.39
17	1,016.23	1,017.77	1,018.06	1,018.64	1,017.48	1,018.06	1,019.56	1,018.60	1,009.68	1,018.89	1,019.60	1,017.18
18	1,007.73	1,018.10	1,017.89	1,018.48	1,017.73	1,018.64	1,015.52	1,017.98	....	1,015.89	1,019.52	1,019.14
19	1,019.18	1,018.18	1,018.02	1,020.35	1,018.77	1,019.27	1,011.60	1,019.27	1,010.35	1,019.35	1,019.56	1,017.93
20	1,020.18	1,019.18	1,018.52	1,020.06	1,018.56	1,018.56	1,013.27	1,019.48	1,008.52	1,019.48	1,019.64	1,015.56
21	1,020.39	1,018.44	1,018.98	1,019.52	1,018.94	1,018.14	1,010.81	1,019.60	1,009.52	1,019.31	1,019.23	1,017.60
22	1,021.02	1,019.31	1,019.35	1,018.94	1,019.18	1,017.89	1,011.86	1,016.98	1,011.31	1,017.68	1,019.48	1,017.85
23	1,020.89	1,019.73	1,019.52	1,018.64	1,018.60	1,017.68	1,019.31	1,010.60	1,014.85	1,019.64	1,019.44	1,011.06
24	1,020.06	1,019.52	1,019.77	1,018.68	1,018.48	1,017.56	1,019.56	1,015.10	1,012.18	1,019.60	1,019.60	1,018.43
25	1,019.73	1,019.64	1,020.48	1,018.14	1,019.18	1,017.56	1,013.06	1,019.23	1,017.60	1,019.52	1,019.56	1,020.81
26	1,019.27	1,019.52	1,021.31	1,019.23	1,019.77	1,017.77	1,011.31	1,018.27	1,020.27	1,019.81	1,019.42	1,019.89
27	1,019.06	1,020.23	1,020.48	1,020.23	1,019.44	1,017.60	1,013.60	1,019.31	1,019.98	1,019.81	1,019.64	1,019.48
28	1,018.77	1,021.81	1,020.10	1,019.48	1,018.89	1,013.39	1,020.31	1,019.44	1,021.73	1,020.31	1,019.23	1,019.31
29	1,018.56	....	1,020.77	1,018.89	1,018.68	1,018.23	1,019.98	1,014.23	1,021.23	1,020.18	1,019.44	1,018.85
30	1,018.35	....	1,021.14	1,018.85	1,018.73	1,017.64	1,019.73	1,011.64	1,020.27	1,020.18	1,019.39	1,019.89
31	1,018.10	....	1,021.52	....	1,018.81	....	1,019.73	1,004.77	....	1,019.81	....	1,020.31

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River at Herkimer, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	378.63	379.23	388.78	380.83	378.43	380.08	378.08	378.93	*a*	......	......	......
2	378.78	378.88	388.63	380.33	378.73	379.28	378.43	378.88	......	......	......	......
3	378.83	378.93	387.33	379.78	379.18	379.03	378.93	378.93	......	......	......	......
4	378.73	378.88	386.48	379.43	381.18	378.83	378.73	378.98	......	......	......	......
5	378.78	378.78	385.88	379.23	380.55	378.93	378.83	379.18	......	......	......	......
6	378.83	378.68	385.38	379.03	379.35	381.53	379.03	378.93	......	......	......	......
7	378.73	378.63	386.18	379.38	378.83	381.93	378.98	379.03	......	......	......	......
8	378.78	378.68	386.28	379.18	378.73	382.53	378.93	378.93	......	......	......	......
9	378.78	378.73	385.58	379.03	378.63	381.58	378.83	379.03	......	......	......	......
10	378.73	378.68	384.38	378.93	378.48	380.73	378.73	379.23	......	......	......	......
11	378.83	378.63	382.23	378.88	378.48	381.55	378.83	379.48	......	......	......	......
12	378.83	378.58	381.13	378.88	378.43	382.05	378.93	380.03	......	......	......	......
13	378.73	378.58	381.18	379.13	378.88	381.85	378.78	380.33	......	......	......	......
14	378.63	378.65	381.43	378.98	378.38	381.23	378.73	380.08	......	......	......	......
15	378.73	378.73	381.13	378.88	378.38	381.43	378.53	379.48	......	......	......	......
16	378.68	378.73	380.38	378.73	378.38	381.03	378.88	379.53	......	......	......	......
17	378.58	378.63	379.93	378.63	378.43	380.78	379.03	379.38	......	......	......	......
18	378.43	378.68	379.68	378.63	378.48	381.63	378.78	379.68	......	......	......	......
19	379.58	378.73	379.88	379.13	379.43	381.28	379.13	379.93	......	......	......	......
20	380.93	378.78	381.48	379.48	379.73	380.53	379.93	379.73	......	......	......	......
21	381.08	378.93	382.73	379.13	380.53	379.53	379.53	379.48	......	......	......	......
22	384.38	379.83	382.83	378.73	380.83	379.43	379.48	379.98	......	......	......	......
23	383.93	380.13	383.18	378.63	379.13	379.13	379.38	380.28	......	......	......	......
24	384.08	379.98	383.68	378.58	379.13	378.68	379.53	380.33	......	......	......	......
25	384.28	379.83	383.28	378.73	380.83	378.43	379.73	380.03	......	......	......	......
26	383.13	379.73	383.48	380.38	382.33	378.43	379.43	379.83	......	......	......	......
27	380.88	380.13	383.13	379.58	381.53	378.33	379.13	379.63	......	......	......	......
28	380.38	386.78	382.83	379.08	379.83	378.43	378.93	379.53	......	......	......	......
29	380.63	......	382.43	378.83	379.43	378.43	378.98	379.63	......	......	......	......
30	380.18	......	381.43	378.73	379.88	378.23	378.93	379.43	......	......	......	......
31	379.18	......	381.08	......	380.68	......	378.83	379.53	......	......	......	......

a Record discontinued.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River at Utica, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	396.59	397.64	406.24	398.09	395.84	397.94	396.24	395.74	396.14	397.19	396.64	397.64
2	396.39	397.44	406.19	397.99	395.84	397.89	396.24	395.74	396.49	396.94	396.69	397.49
3	396.44	397.44	404.99	397.89	395.94	397.74	396.24	395.74	396.84	396.84	396.99	397.44
4	396.24	397.44	404.04	397.74	395.99	397.59	396.14	395.74	397.14	396.74	397.14	397.44
5	396.19	397.49	403.44	397.59	396.09	397.54	396.14	395.74	397.49	396.69	397.59	397.34
6	396.29	397.44	403.19	397.49	396.19	397.69	396.14	395.74	397.99	396.64	397.99	397.14
7	396.39	397.19	403.24	397.54	396.24	397.79	396.04	395.74	398.29	396.64	398.14	396.94
8	396.44	397.09	403.24	397.39	396.24	397.89	396.04	395.69	398.39	396.54	398.19	396.44
9	396.44	397.04	402.39	397.19	396.34	397.94	396.04	395.64	398.39	396.44	398.49	396.14
10	396.34	397.04	401.34	396.99	396.49	398.04	395.94	395.69	398.04	396.39	398.69	396.14
11	396.34	396.99	400.44	396.99	396.64	398.04	395.94	395.94	397.34	396.34	398.84	396.14
12	396.29	396.94	399.54	397.19	396.59	398.04	395.94	395.94	396.89	396.34	398.79	396.14
13	396.24	396.94	398.74	397.19	396.44	398.04	395.94	396.04	396.74	396.34	398.74	396.04
14	396.34	396.94	398.64	397.09	396.19	397.89	395.94	396.04	396.94	396.34	398.74	396.04
15	396.34	397.04	398.49	396.89	395.89	397.64	395.94	396.04	397.14	396.24	398.24	395.99
16	396.34	397.04	398.44	396.69	395.84	397.64	395.94	395.99	396.99	396.24	398.14	395.94
17	396.34	397.14	398.54	396.54	395.79	397.69	395.94	395.94	396.74	396.24	398.04	395.94
18	396.69	397.19	398.64	396.64	395.84	398.04	395.94	395.94	396.54	396.14	397.89	396.04
19	398.44	397.24	398.79	396.74	396.29	398.09	395.94	395.99	396.39	396.14	397.84	396.09
20	400.09	397.14	398.89	396.84	396.64	397.84	395.84	395.94	396.34	396.14	397.89	396.14
21	402.04	397.14	399.04	396.79	396.94	397.49	395.84	395.99	396.34	396.04	397.94	396.14
22	402.84	397.14	399.14	396.69	397.14	397.09	395.84	396.14	396.39	396.19	397.84	396.14
23	403.09	397.04	399.34	396.54	397.14	396.89	395.84	396.24	396.24	396.54	397.84	396.24
24	403.14	397.04	399.59	396.44	397.19	396.69	395.84	396.19	396.29	396.79	397.74	396.49
25	402.99	397.14	399.74	396.44	397.49	396.59	395.84	396.04	396.79	396.94	397.64	396.64
26	401.89	397.14	400.09	396.34	397.44	396.44	395.84	396.09	397.24	397.09	397.54	396.64
27	399.94	397.79	400.14	396.19	397.14	396.34	395.84	396.44	397.34	397.34	397.34	396.74
28	398.34	403.59	399.94	396.14	396.99	396.34	395.74	396.54	397.44	397.24	397.19	396.79
29	397.99	......	399.54	396.04	396.94	396.34	395.74	396.34	397.64	396.84	397.19	398.44
30	397.84	......	399.09	395.94	397.19	396.29	395.74	396.09	397.54	396.89	397.49	399.74
31	397.74	......	398.49	......	397.99	......	395.74	395.99	......	396.79	......	400.14

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River below State Dam at Rome, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	428.26	429.06	435.99	430.26	428.06	429.06	428.26	428.06	428.86	428.46	428.66	428.66
2.....	428.26	429.26	436.46	430.06	428.06	429.06	428.26	428.06	428.76	428.46	428.66	428.66
3.....	428.66	429.26	433.93	429.96	429.46	429.26	428.26	428.06	428.06	428.46	429.26	428.66
4.....	428.46	429.26	430.89	429.66	429.96	428.66	428.26	428.06	429.06	428.06	428.86	428.56
5.....	428.46	429.26	430.46	429.66	429.76	428.96	428.36	429.66	429.06	427.96	428.96	428.56
6.....	428.46	429.06	430.56	429.56	429.26	430.46	428.26	428.46	429.06	428.66	429.26	428.56
7.....	428.46	428.86	433.56	429.36	429.06	431.96	428.26	428.46	429.06	429.86	428.86	428.56
8.....	428.46	428.86	431.46	429.26	429.06	430.06	428.46	428.46	427.96	428.86	428.66	428.56
9.....	428.66	429.06	430.46	429.16	429.06	429.76	428.46	428.26	427.96	428.86	428.66	428.46
10.....	428.66	429.26	429.96	429.26	428.26	429.46	428.26	428.46	428.76	428.66	429.26	428.46
11.....	428.66	429.16	429.76	429.26	428.06	429.86	428.46	429.86	428.46	428.26	430.26	428.46
12.....	428.66	429.16	429.86	429.16	428.06	429.66	428.26	428.86	428.46	428.46	429.76	428.46
13.....	428.66	428.86	429.86	429.26	427.96	429.46	428.26	428.86	427.96	428.46	428.86	428.46
14.....	428.66	428.86	430.26	429.16	427.96	429.26	428.46	428.26	428.46	428.56	428.66	428.46
15.....	428.66	428.86	429.76	429.16	427.96	429.46	428.46	428.26	428.46	428.46	428.66	428.46
16.....	428.46	428.96	429.76	429.16	427.96	428.86	428.46	428.46	428.06	428.36	428.66	428.46
17.....	428.46	428.86	429.56	429.16	427.96	429.16	428.26	428.26	428.06	428.36	428.66	428.46
18.....	428.46	428.86	429.36	429.66	427.96	429.96	428.26	428.26	428.06	428.46	428.56	428.46
19.....	430.46	428.76	429.36	430.16	429.86	429.86	428.26	429.26	428.06	428.36	428.26	428.46
20.....	430.26	428.76	429.96	429.96	429.46	429.66	428.06	428.56	428.06	428.26	428.26	428.46
21.....	429.86	429.06	430.46	429.46	431.66	429.46	428.06	428.36	427.96	428.26	428.16	428.46
22.....	432.46	429.36	430.66	429.26	429.66	429.26	428.46	428.16	427.96	428.26	428.06	428.46
23.....	431.46	429.26	430.96	429.16	429.66	429.46	428.26	427.96	427.96	428.66	428.66	428.46
24.....	430.46	429.16	430.96	429.16	429.06	429.36	428.26	427.96	427.96	428.66	428.76	428.46
25.....	430.46	429.06	432.26	429.06	432.46	428.86	428.26	427.96	427.96	428.46	429.06	428.46
26.....	430.46	429.06	431.26	429.16	430.66	428.26	428.26	427.96	428.66	429.06	428.96	428.46
27.....	430.46	429.66	430.46	429.86	429.26	428.26	428.26	428.06	428.06	428.86	428.86	428.46
28.....	430.46	436.26	430.46	429.46	429.46	428.86	430.86	427.96	429.86	429.26	428.76	428.46
29.....	430.26	......	430.76	429.26	428.96	428.46	428.66	428.06	428.66	428.86	428.66	428.56
30.....	429.46	......	430.76	429.16	428.76	428.46	428.26	427.96	428.56	428.76	428.66	428.76
31.....	429.26	......	430.66	......	429.86	......	428.26	427.96	......	428.76	......	429.06

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River above Dam at Rome, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	431.80	431.80	437.93	432.80	430.20	431.80	430.60	430.30	432.00	431.60	431.80	431.80
2.....	430.80	432.00	437.27	432.60	431.10	431.60	430.80	430.20	432.00	431.80	431.90	431.90
3.....	431.40	432.00	434.97	432.50	432.00	431.80	430.80	430.20	431.00	431.60	432.40	431.90
4.....	431.20	432.00	433.30	432.20	432.50	432.00	430.80	430.20	432.20	430.30	432.00	431.70
5.....	431.20	432.00	433.00	432.20	432.30	431.70	431.40	432.20	432.20	430.00	432.10	431.70
6.....	431.20	431.60	433.00	432.10	432.00	433.20	431.40	431.60	432.10	431.80	432.40	431.80
7.....	431.20	431.50	435.95	431.90	431.80	434.60	431.40	431.50	432.10	432.70	432.10	431.80
8.....	431.20	431.50	434.10	431.90	431.80	432.60	431.50	431.50	430.60	431.60	431.90	431.80
9.....	431.40	431.70	433.00	431.80	431.80	432.40	431.60	430.50	430.10	431.90	431.90	431.80
10.....	431.40	431.90	432.70	431.90	431.10	432.00	431.40	431.00	431.60	431.80	432.40	431.70
11.....	431.40	431.80	432.50	431.90	429.80	432.30	431.50	432.40	431.60	431.60	432.70	431.70
12.....	431.40	431.80	432.40	431.80	429.80	432.20	431.40	431.60	431.60	431.60	432.40	431.70
13.....	431.40	431.80	432.50	431.90	429.80	432.00	431.40	431.80	431.00	431.60	432.00	431.70
14.....	431.40	431.80	432.80	431.80	429.50	431.90	431.50	431.40	431.60	431.70	431.80	431.80
15.....	431.40	431.80	432.30	431.80	429.50	431.90	431.50	431.60	431.60	431.60	431.90	431.80
16.....	431.20	432.00	432.20	431.70	429.50	431.70	431.50	431.70	430.80	431.60	431.80	431.80
17.....	431.10	431.80	432.10	431.80	429.50	431.70	431.50	429.80	431.60	431.50	431.90	431.80
18.....	431.20	431.80	432.00	432.20	430.90	432.60	431.50	429.60	431.50	431.60	431.70	431.70
19.....	433.20	431.70	432.00	432.70	432.50	432.40	431.40	432.00	431.60	431.60	430.60	431.70
20.....	433.00	431.80	432.60	432.30	432.20	432.20	430.50	431.60	431.40	431.10	430.80	431.70
21.....	432.60	431.90	433.00	432.10	434.20	432.00	430.80	431.40	430.20	431.50	430.80	431.70
22.....	435.20	432.00	433.10	431.80	432.20	432.00	431.80	430.80	430.20	431.60	430.70	431.60
23.....	434.50	432.00	433.20	431.70	432.20	431.90	430.90	430.20	430.20	431.90	431.80	431.60
24.....	433.50	431.90	433.20	431.70	431.60	431.90	431.60	430.40	430.20	431.80	431.90	431.70
25.....	433.00	431.90	433.90	431.70	435.00	431.40	431.40	430.20	430.30	431.60	432.10	431.70
26.....	432.60	431.90	433.40	431.90	433.40	431.50	431.40	430.40	431.70	432.20	432.10	431.70
27.....	432.40	432.40	432.80	432.40	432.00	431.00	430.60	430.60	430.70	432.00	432.00	431.70
28.....	432.40	439.20	432.80	432.10	432.00	431.80	432.20	430.50	432.60	432.40	431.90	431.70
29.....	432.40	......	433.00	432.00	431.80	431.40	431.50	430.40	431.60	431.90	431.90	431.90
30.....	432.20	......	433.00	431.80	431.60	430.60	431.00	430.40	431.70	431.90	431.80	432.10
31.....	432.00	......	432.90	......	432.40	......	430.60	430.40	......	431.90	......	432.30

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River at Floyd Ave. Bridge Rome, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	446.79	446.59	450.56	447.71	446.53	446.79	446.53	446.59	446.61	446.71	446.71	446.69
2	446.92	446.69	449.93	447.19	446.91	446.83	446.59	446.53	446.61	446 61	446.76	446.56
3	447.26	446.84	448.96	447.01	447.16	446.79	446.56	446.56	446.86	446.56	447.16	446.61
4	447.32	447.59	448.36	446.91	447.33	446.79	446.51	446.51	446.94	446.61	446.86	446.61
5	447.32	447.49	448.06	446.89	446.79	446.81	446.56	446.76	446.83	446.56	447.33	446.41
6	447.29	447.24	448.73	446.83	446.66	448.13	446.51	446.83	446.96	446.53	447.46	446.46
7	447.26	446.94	450.16	446.86	446.61	448.86	446.53	446.69	446.84	447.83	447.13	446.51
8	447.32	447.01	448.33	446.81	446.53	447.39	446.63	446.61	446.68	446.91	446.99	446.56
9	447.19	447.21	447.73	446.76	446.59	447.16	446.59	446.61	446.61	446.71	446.91	446.51
10	447.14	447.26	447.43	446.71	446.86	447.11	446.56	446.86	446.61	446.69	447.26	446.89
11	446.99	447.16	447.21	446.69	446.66	447.31	446.66	447.71	446.51	446.66	448.46	446.83
12	447.09	447.31	447.21	446.83	446.53	447.21	446.56	446.83	446.54	446.61	447.31	446.73
13	446.99	447.36	447.23	446.73	446.49	447.01	446.53	446.63	446.58	446.63	447.16	446.63
14	447.04	447.23	447.69	446.63	446.49	446.86	446.53	446.56	446.59	446.61	447.13	446.63
15	447.02	447.16	447.13	446.61	446.43	446.76	446.53	446.56	446.51	446.53	446.99	446.61
16	447.09	447.06	446.99	446.61	446.41	446.71	446.59	446.49	446.46	446.61	446.99	446.61
17	447.14	447.11	446.81	446.53	446.41	446.73	446.56	446.49	446.49	446.59	446.91	446.61
18	446.99	447.06	446.83	446.61	447.09	448.13	446.53	446.51	446.51	446.56	446.76	446.61
19	446.94	447.21	447.09	447.16	447.43	447.21	446.51	446.63	446.51	446.56	446.71	446.66
20	447.44	447.16	447.99	446.83	446.91	446.89	446.51	446.56	446.43	446.51	446.61	446.66
21	448.89	447.26	448.21	446.73	448.51	446.83	446.51	446.51	446.43	446.56	446.56	446.59
22	450.04	447.79	447.93	446.66	447.36	446.73	446.63	446.43	446.49	446.83	446.59	446.61
23	448.59	447.71	448.26	446.63	447.01	446.71	446.61	446.41	446.43	446.86	446.69	446.61
24	447.69	447.61	448.66	446.53	446.91	446.71	446.61	446.41	446.51	446.71	446.73	446.71
25	447.24	447.41	449.51	446.51	449.16	446.73	446.59	446.41	446.56	446.83	447.01	446.71
26	446.94	447.51	448.69	446.86	447.56	446.61	446.53	446.59	446.73	447.01	446.93	446.73
27	446.89	447.56	447.83	446.63	447.06	446.61	446.51	446.56	447.19	446.96	446.73	446.71
28	446.79	451.58	447.83	446.61	446.96	446.66	447.49	446.51	448.06	447.26	446.66	446.71
29	446.74	......	448.16	446.61	446.76	446.63	446.66	446.51	446.89	447.06	446.71	446.86
30	446.74	......	447.76	446.61	447.11	446.51	446.61	446.51	446.66	446.86	446.71	450.01
31	446.66	......	447.71	......	447.49	......	446.61	446.51	......	446.79	......	449.01

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River below Dam at Ridge Mills, N. Y.

DAY.	Jan.	Feb.
1910.		
1	455.79	455.89
2	456.29	455.89
3	456.19	455.89
4	455.79	455.79
5	456.79	455.69
6	456.59	455.69
7	456.89	455.79
8	456.89	455.99
9	456.89	456.09
10	456.89	456.09
11	457.49	456.29
12	456.59	456.49
13	456.59	456.49
14	456.59	456.39
15	456.49	456.49
16	456.59	456.29
17	456.59	456.39
18	458.19	456.39
19	457.79	456.39
20	457.59	456.49
21	460.79	456.59
22	*a*	456.99
23	*a*	456.99
24	*a*	456.99
25	*a*	456.99
26	*a*	456.79
27	456.09	457.09
28	456.09	*b*
29	455.89	......
30	455.79	......
31	457.29	......

a Gage taken out by ice. *b* Gage taken out by ice; reading discontinued.

Mean Daily Elevations of Water-surface (Barge Canal Datum) of Mohawk River above Dam at Ridg Mills, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	465.60	466.30	468.83	467.00	466.10	466.80	466.00	466.00	466.00	466.10	466.10	466.00
2......	465.70	466.30	468.53	466.70	466.20	466.30	466.00	466.00	466.00	466.10	466.10	466.00
3......	465.80	466.30	467.73	466.70	466.60	466.30	466.00	465.90	466.00	466.00	466.20	466.00
4......	465.40	466.20	467.46	466.50	467.00	466.30	466.00	466.00	466.00	466.00	466.30	466.00
5......	465.00	466.10	467.22	466.40	466.60	466.20	466.00	466.30	466.10	466.00	466.50	465.80
6......	465.90	466.00	467.83	466.20	466.30	466.50	466.00	466.10	466.20	466.60	466.90	465.90
7......	466.00	466.20	468.13	466.30	466.10	468.10	466.00	466.00	466.30	466.30	466.50	465.90
8......	466.00	466.40	467.13	466.30	466.10	466.80	466.10	466.00	466.10	466.40	466.40	465.90
9......	465.80	466.20	467.00	466.20	466.00	466.60	466.10	466.00	466.00	466.20	466.30	465.80
10......	465.80	466.20	466.60	466.20	466.20	466.60	466.00	465.90	466.00	466.10	467.10	466.00
11......	466.40	466.10	466.60	466.10	466.20	466.50	466.10	467.20	465.90	466.10	467.60	465.90
12......	466.90	466.30	466.50	466.20	466.10	466.50	466.00	466.30	465.90	466.10	466.80	465.40
13......	466.30	466.30	466.60	466.30	466.00	466.50	466.00	466.10	465.90	466.00	466.60	466.40
14......	466.20	466.30	466.80	466.20	466.00	466.30	466.00	466.00	466.00	466.00	466.50	466.20
15......	466.20	466.20	466.30	466.20	466.00	466.20	466.00	465.90	465.90	466.00	466.40	466.00
16......	466.20	466.20	466.30	466.10	466.00	466.20	466.00	465.90	465.90	466.00	466.40	466.00
17......	466.20	466.30	466.20	466.10	466.00	466.20	466.00	465.90	465.90	466.00	466.40	466.00
18......	466.10	466.20	466.10	466.10	466.00	467.20	466.00	466.00	465.90	466.00	466.20	466.00
19......	467.00	466.20	466.20	466.70	467.00	466.70	466.00	466.20	465.90	466.00	466.10	466.10
20......	466.70	466.30	466.80	466.50	466.60	466.40	466.00	466.10	465.80	466.00	466.10	466.10
21......	466.70	466.50	467.20	466.30	467.50	466.20	465.90	466.00	465.80	466.00	466.00	466.00
22......	467.40	466.50	467.20	466.10	466.80	466.20	466.10	466.00	465.80	466.10	466.10	466.00
23......	*a*	466.50	467.40	466.10	466.40	466.20	466.00	465.90	465.80	466.30	466.10	466.00
24......	*a*	466.50	467.50	466.10	468.40	466.20	466.00	465.80	465.80	466.10	466.30	466.10
25......	*a*	466.50	468.20	466.00	467.50	466.20	466.00	465.80	465.90	466.10	466.50	466.20
26......	*a*	466.40	468.00	466.20	466.10	466.10	465.90	465.90	466.10	466.10	466.40	466.20
27......	466.20	466.60	467.40	466.20	466.50	466.10	465.90	466.00	466.00	466.20	466.20	466.20
28......	466.20	469.15	467.20	466.00	466.40	466.10	467.20	466.00	467.70	466.70	466.10	466.20
29......	465.90	......	467.60	466.00	466.20	466.10	466.10	466.00	466.40	466.50	466.10	466.20
30......	465.70	......	467.00	466.10	466.30	466.10	466.10	466.00	466.10	466.30	466.10	466.80
31......	467.30	......	467.00	......	466.60	......	466.00	465.90	......	466.20	......	466.40

a No record.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River at Lock 7 near Delta, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	480.00	480.65	484.77	481.30	480.10	480.45	480.00	480.00	480.35	481.05	480.95	481.00
2......	479.90	480.65	484.03	481.20	481.00	480.35	480.10	479.95	480.30	480.80	481.10	480.90
3......	479.90	480.70	483.50	480.85	481.35	480.45	480.05	479.90	480.70	480.60	481.20	480.75
4......	480.00	480.80	482.50	480.80	481.25	480.55	480.00	480.85	480.65	480.50	481.00	480.35
5......	480.05	480.75	482.50	480.75	480.60	480.65	479.90	480.50	480.55	480.65	481.65	480.65
6......	480.10	480.60	482.40	480.70	480.35	481.70	480.00	480.40	481.60	481.30	481.80	480.65
7......	480.20	480.50	484.77	480.60	480.35	482.00	480.10	480.25	481.10	481.85	481.30	480.75
8......	480.15	480.80	482.25	480.55	480.20	481.35	480.15	480.30	480.75	481.00	481.20	480.65
9......	480.15	480.75	481.75	480.45	480.10	481.00	480.00	480.20	480.50	480.90	481.30	480.70
10......	480.10	480.75	481.65	480.60	480.45	481.10	480.15	481.05	480.30	480.85	482.80	480.65
11......	480.05	480.70	481.10	480.45	480.30	481.30	480.20	481.50	480.10	480.80	482.60	480.65
12......	480.10	480.85	481.05	480.30	480.05	481.05	480.10	480.70	480.00	480.75	481.75	480.70
13......	480.00	480.85	481.10	480.20	480.00	480.80	480.10	480.20	480.20	480.70	481.55	480.60
14......	479.90	480.80	481.10	480.15	479.90	480.50	480.00	480.00	480.15	480.60	481.40	480.65
15......	479.90	480.70	480.90	480.15	479.90	480.35	480.10	479.95	480.05	480.70	481.35	480.85
16......	480.05	480.80	480.80	480.10	479.80	480.50	480.00	479.90	480.00	480.65	481.45	480.70
17......	480.00	480.75	480.65	480.05	481.00	480.45	480.00	480.00	479.90	480.65	481.20	480.60
18......	480.10	480.75	480.90	480.80	481.65	482.00	480.10	480.00	480.05	480.65	481.00	480.65
19......	481.75	480.75	480.75	480.90	480.70	481.25	479.80	480.35	480.05	480.60	481.05	480.60
20......	481.00	480.85	481.10	480.90	482.95	480.80	479.90	480.10	480.00	480.55	480.90	480.70
21......	481.00	480.85	481.65	480.60	481.00	480.50	479.90	480.05	480.00	480.65	480.80	480.55
22......	484.17	480.85	482.50	480.30	480.70	480.45	480.30	480.00	479.90	481.00	481.05	480.65
23......	482.45	480.80	482.90	480.20	480.80	480.45	480.20	479.90	479.95	480.90	481.25	480.75
24......	481.75	480.75	483.25	480.10	480.90	480.40	480.20	479.95	480.10	480.80	481.45	480.90
25......	481.75	480.75	484.80	480.05	481.45	480.30	480.05	479.95	480.05	480.85	481.30	481.00
26......	481.60	480.85	482.55	480.65	483.45	480.40	480.00	480.05	480.30	481.10	481.35	480.95
27......	481.25	482.15	481.65	480.50	480.80	480.30	480.10	480.10	480.80	481.45	481.10	480.90
28......	480.90	486.27	481.90	480.25	480.55	480.10	481.10	480.00	482.00	481.55	480.95	480.80
29......	480.75	......	482.25	480.20	480.55	480.00	480.50	480.05	481.20	481.40	480.95	480.95
30......	480.80	......	482.65	480.00	481.20	480.10	480.20	480.00	481.00	481.10	481.05	482.10
31......	481.00	......	481.75	......	480.85	......	480.10	480.05	......	480.90	......	481.95

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River below Dam at Delta, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1......	*a*	*a*	*a*	503.50	504.00	502.70	502.80	502.70	*b*	503.00	502.90	503.00
2......	*a*	*a*	*a*	502.80	503.00	502.70	503.20	502.60	*b*	502.60	502.70	502.70
3......	*a*	*a*	*a*	502.90	502.90	502.60	502.70	502.40	502.30	502.50	505.00	502.60
4......	*a*	*a*	*a*	502.90	504.95	502.60	502.60	502.30	503.00	506.00	504.50	502.50
5......	*a*	*a*	*a*	503.00	503.80	502.90	502.40	502.40	502.70	503.40	503.30	502.50
6......	*a*	*a*	*a*	503.00	503.30	505.00	502.40	502.30	502.70	503.00	503.20	502.50
7......	*a*	*a*	*a*	502.70	503.10	503.80	502.40	502.30	502.60	503.50	507.60	502.50
8......	*a*	*a*	*a*	502.80	503.20	503.10	502.40	502.30	502.50	508.30	504.80	502.60
9......	*a*	*a*	*a*	502.90	502.90	502.80	502.40	502.30	502.50	504.00	504.00	502.80
10......	*a*	*a*	*a*	502.90	503.20	502.70	502.30	502.30	502.60	503.60	503.40	509.50
11......	*a*	*a*	*a*	502.90	503.20	502.70	502.30	502.30	504.45	503.10	503.30	505.00
12......	*a*	*a*	*a*	503.20	503.20	502.70	502.60	502.30	503.70	503.40	503.20	503.50
13......	*a*	*a*	*a*	503.00	502.90	502.60	502.60	502.20	502.80	503.10	503.00	502.80
14......	*a*	*a*	502.70	503.30	502.70	502.50	502.40	502.30	502.60	502.70	502.90	502.80
15......	*a*	*a*	503.00	502.90	502.60	502.40	502.30	502.20	502.50	502.90	502.90	502.70
16......	*a*	*a*	503.00	502.80	502.60	502.40	502.30	502.30	502.50	502.80	502.80	502.70
17......	*a*	*a*	502.70	502.90	502.80	502.40	502.60	502.40	502.40	502.70	502.80	502.80
18......	*a*	*a*	503.20	502.90	502.60	502.40	502.60	502.30	502.50	502.80	502.80	502.70
19......	*a*	*a*	503.40	502.70	502.60	502.40	502.50	502.30	502.40	502.60	502.80	502.70
20......	505.50	*a*	504.80	502.80	502.60	502.50	502.40	502.30	502.40	502.70	502.90	502.60
21......	503.00	*a*	503.60	502.60	502.60	502.40	502.30	502.30	502.50	502.80	502.90	502.70
22......	502.60	*a*	505.15	502.60	502.60	502.40	502.30	502.30	502.40	502.60	502.90	502.70
23......	*a*	*a*	506.00	502.60	502.40	502.30	502.70	502.20	502.40	502.70	502.80	505.70
24......	*a*	*a*	506.80	505.20	502.30	502.30	502.40	502.20	502.60	502.80	502.80	506.40
25......	*a*	*a*	504.50	503.20	502.30	502.40	504.30	*b*	502.50	502.70	502.80	503.90
26......	*a*	*a*	504.40	505.20	502.40	502.30	502.80	*b*	503.10	502.60	502.70	503.40
27......	*a*	*a*	506.45	504.20	503.10	502.40	502.70	*b*	502.60	502.60	502.70	503.30
28......	*a*	*a*	507.20	503.30	503.40	502.40	502.40	*b*	502.70	505.50	502.70	504.50
29......	*a*	......	505.20	503.00	502.80	502.30	502.40	*b*	502.90	504.00	503.00	504.00
30......	*a*	......	505.00	502.90	502.80	502.50	502.40	*b*	503.40	503.30	503.00	505.25
31......	*a*	......	503.90	......	502.90	......	502.40	*b*	......	503.00	......	505.00

a Ice obstruction. *b* Below gage; no record.

NOTE — This table supersedes that appearing in State Engineer's report for 1907, page 541, which was referred to incorrect datum.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River below Dam at Delta, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
1......	503.50	502.50	502.60	504.30	506.20	503.20	502.50	502.40	502.50	502.60	502.60	503.00
2......	503.20	502.50	502.70	504.80	504.00	502.80	502.40	502.40	502.60	502.50	502.60	502.30
3......	502.80	502.50	503.40	503.80	504.20	502.60	502.50	502.40	502.50	502.60	502.50	502.30
4......	502.60	502.40	503.10	503.50	503.70	502.60	502.50	502.50	502.50	502.60	502.60	502.40
5......	502.80	*a*	502.80	503.60	503.10	502.50	502.40	502.60	502.50	502.60	502.60	502.40
6......	502.80	*a*	502.70	505.30	503.00	502.50	502.40	502.50	502.50	502.60	502.60	502.20
7......	502.70	*a*	502.70	505.00	504.20	502.50	502.40	502.50	502.60	502.60	502.60	502.40
8......	502.80	*a*	502.80	506.50	505.20	502.50	503.40	502.50	502.60	502.50	502.70	503.00
9......	502.80	*a*	502.80	506.50	503.80	502.40	502.90	502.50	502.60	502.50	502.80	502.60
10......	502.60	*a*	502.60	504.40	503.50	502.80	502.50	502.40	502.60	502.50	502.80	502.50
11......	502.60	*a*	502.70	505.00	503.00	502.70	502.50	502.40	502.60	502.80	503.10	502.50
12......	502.70	*a*	502.80	504.00	503.00	502.60	502.40	502.40	502.60	502.60	503.10	502.60
13......	504.00	502.30	503.30	503.80	502.90	502.50	502.50	502.70	502.60	502.60	502.80	502.60
14......	503.00	502.50	504.00	503.50	503.00	502.50	502.50	502.60	502.60	502.50	502.80	502.50
15......	502.80	507.50	504.10	503.70	503.30	502.90	502.40	502.50	502.60	502.60	502.70	502.50
16......	502.80	507.00	506.00	503.90	503.10	503.00	502.40	502.50	502.60	502.60	502.70	503.20
17......	502.60	505.00	504.50	503.30	504.00	502.70	502.40	*b*	502.60	502.60	502.70	502.90
18......	502.60	504.40	504.00	503.40	503.00	502.60	506.20	*b*	502.60	502.60	502.70	502.80
19......	502.60	504.00	503.70	504.00	502.80	502.50	504.50	502.50	502.60	502.60	502.80	502.70
20......	502.60	503.50	503.30	503.50	502.70	505.00	503.30	502.50	502.50	502.50	503.30	502.70
21......	502.50	503.50	503.10	503.30	502.70	503.00	502.80	502.40	502.60	502.60	502.90	502.70
22......	502.70	503.20	503.20	503.10	502.60	502.70	504.50	502.70	502.60	502.50	502.80	502.50
23......	502.60	503.00	503.50	503.30	502.60	503.00	503.00	502.50	502.60	502.50	503.10	502.40
24......	502.60	502.90	504.70	503.20	502.50	502.70	502.70	502.50	502.60	502.50	503.60	502.40
25......	502.40	502.80	504.40	503.20	502.50	502.80	502.60	502.50	502.60	502.60	504.00	502.60
26......	502.70	502.90	504.10	503.40	502.50	502.60	503.00	502.40	502.60	502.70	503.70	502.60
27......	502.70	502.80	506.60	503.10	502.90	502.50	502.80	502.50	502.60	502.80	503.30	502.60
28......	502.60	502.70	507.55	503.60	502.80	502.50	502.60	502.50	502.60	502.70	503.00	502.50
29......	502.50	502.70	505.10	503.30	502.50	502.40	502.50	502.50	503.00	503.00	502.80	502.50
30......	502.50	......	504.60	503.00	502.60	502.50	502.40	502.50	502.80	502.70	502.70	502.50
31......	502.40	......	504.50	......	503.40	......	502.50	502.50	......	502.60	......	502.60

a Ice obstruction. *b* No record.

NOTE.— This table supersedes that appearing in State Engineer's report for 1908, page 615, h was referred to incorrect datum.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River below Dam at Delta N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1	502.60	502.50	*b*	504.45	506.10	502.40	502.60	502.40	502.40	502.40	502.60	502.50
2	502.60	502.60	*b*	504.20	504.00	502.50	502.60	502.40	502.30	502.40	502.50	502.50
3	502.60	502.50	503.20	505.30	503.80	502.50	502.70	502.40	502.20	502.50	502.50	502.40
4	502.60	502.50	503.00	504.80	503.70	502.40	502.60	502.20	502.30	502.50	502.50	502.40
5	504.50	502.50	502.80	505.00	503.20	504.50	502.60	502.20	502.80	502.50	502.40	502.40
6	506.70	505.70	502.70	506.00	503.10	503.70	502.50	502.20	502.60	502.40	502.60	502.40
7	504.60	*a*	502.70	508.80	503.50	502.70	502.40	502.20	502.50	502.30	502.60	502.30
8	503.30	*a*	502.70	506.00	503.20	502.80	502.40	502.30	502.30	502.40	502.40	502.40
9	503.00	*a*	502.70	504.60	503.00	502.80	502.40	502.40	502.40	502.40	502.70	502.40
10	503.00	*a*	502.80	504.00	503.50	502.70	502.50	502.20	502.30	502.30	502.60	502.40
11	503.00	*a*	503.50	503.70	504.90	503.00	502.50	502.00	502.40	502.30	502.60	502.40
12	502.90	*a*	503.10	503.50	503.30	502.80	502.50	502.20	502.30	502.60	502.50	502.40
13	502.90	*a*	502.90	505.00	503.00	502.80	502.40	502.10	502.30	502.50	502.50	502.40
14	502.80	502.80	502.80	508.75	502.80	502.90	502.40	502.00	502.40	502.50	502.50	502.40
15	502.60	502.80	502.80	505.00	502.80	502.70	502.50	502.20	502.30	502.50	502.50	502.50
16	502.50	502.70	502.70	504.10	503.20	502.50	502.50	502.10	502.50	502.40	502.80	502.50
17	502.50	502.90	502.70	504.30	503.10	502.40	502.50	502.40	502.30	503.00	503.90	502.50
18	502.50	502.80	502.60	504.00	503.10	503.40	502.50	502.60	502.30	502.70	503.20	502.50
19	502.40	502.60	502.40	504.00	502.90	502.80	502.50	502.60	502.30	502.80	503.00	502.40
20	502.50	506.00	502.40	504.00	502.80	502.70	502.50	502.40	502.20	502.70	502.70	502.40
21	502.50	*a*	502.30	503.40	502.70	502.50	502.50	502.20	502.20	502.70	502.80	502.40
22	502.60	*a*	502.40	504.70	502.70	502.60	502.40	502.30	502.10	503.00	503.00	502.40
23	503.20	*a*	502.60	503.50	502.70	502.60	503.30	502.10	502.20	503.20	504.00	502.40
24	507.00	505.40	502.70	503.10	502.60	502.60	503.40	502.10	502.50	502.80	503.00	502.40
25	506.00	*b*	505.75	503.00	502.60	502.60	502.80	502.20	502.40	502.70	502.70	502.40
26	504.20	*b*	504.40	503.00	502.50	502.50	502.70	502.30	502.40	502.70	502.80	502.40
27	503.30	*b*	503.60	502.80	502.40	502.50	502.60	502.20	502.30	502.70	502.50	502.40
28	503.20	*b*	503.40	503.80	502.70	502.30	502.50	502.10	502.30	502.70	502.50	502.30
29	503.00	......	503.60	503.00	502.50	502.60	502.40	502.40	502.30	502.60	503.40	502.30
30	502.80	......	503.50	504.55	502.50	502.60	502.40	502.30	502.50	502.60	502.80	502.00
31	502.70	......	503.30	......	502.40	......	502.40	502.30	......	502.60	......	502.00

a Ice obstruction. *b* No record.

NOTE.— This table supersedes that appearing in State Engineers' report for 1909, page 491, which was referred to incorrect datum.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Mohawk River below Dam at Delta N. Y.

DAY.	Jan.	Feb.	Mar.
1910.			
1	502.0	*b*	507.00
2	*a*	*b*	506.30
3	*a*	*b*	505.30
4	*a*	*b*	504.80
5	*a*	*b*	504.30
6	*a*	*b*	504.30
7	*a*	*b*	507.30
8	*a*	*b*	504.70
9	*a*	502.50	504.00
10	*a*	502.50	503.30
11	502.30	502.40	503.20
12	502.40	502.50	503.10
13	502.40	502.50	503.30
14	502.30	502.40	503.40
15	502.30	502.50	503.20
16	502.40	502.50	503.00
17	502.30	502.60	502.80
18	502.30	502.50	502.60
19	503.60	502.40	502.60
20	503.10	502.60	504.20
21	502.90	502.60	504.60
22	505.70	503.00	504.30
23	504.60	502.70	504.80
24	*b*	502.70	504.70
25	*b*	502.60	506.00
26	*b*	502.60	*c*
27	*b*	502.80	......
28	*b*	508.70	......
29	*b*	......	......
30	*b*	......	......
31	*b*	......	......

a Ice obstruction. *b* Gage broken; no record. *c* No record, March 26 to December 31 inclusive.

Mean Daily Elevation of Water-surface Barge Canal Datum of Mohawk River above Dam at Delta, N. Y.

DAY	Jan	Feb	Mar	April	May	June	July	Aug.	Sept	Oct	Nov	Dec.
1910												
1	508.95	509.15	510.85	509.65	509.15	509.25	509.15	509.05	509.25	509.25	509.25	509.25
2	509.05	509.25	510.65	509.55	509.55	509.35	509.05	509.05	509.15	509.25	509.35	509.25
3	508.95	509.15	510.25	509.45	509.65	509.25	509.15	508.95	509.15	509.15	509.55	509.25
4	508.95	509.05	510.15	509.25	509.75	509.25	509.15	509.45	509.15	509.15	509.65	*a*
5	509.05	509.05	509.85	509.15	509.35	509.35	509.05	509.35	509.25	509.15	509.85	509.05
6	509.15	509.05	509.85	509.35	509.25	510.05	509.15	509.35	509.25	509.55	*a*	509.15
7	509.05	509.15	511.05	509.15	509.15	510.35	509.05	509.15	509.55	509.85	509.55	509.15
8	508.95	509.15	510.05	509.25	509.15	509.75	509.15	509.05	509.25	509.45	509.55	509.15
9	509.15	509.15	509.75	509.25	509.15	509.55	509.05	508.95	509.15	*a*	509.45	509.15
10	509.05	509.15	509.55	509.35	509.35	509.45	509.05	509.80	509.05	509.35	510.55	509.05
11	509.05	509.05	509.55	509.25	509.25	509.45	509.05	509.95	509.05	509.25	510.25	*a*
12	509.05	509.15	509.45	509.35	509.15	509.55	509.05	509.35	509.05	509.25	509.65	509.05
13	509.05	509.15	509.55	509.25	509.05	509.45	509.15	509.25	509.15	509.15	*a*	509.05
14	508.95	509.05	509.65	509.15	509.05	509.35	509.05	509.15	509.15	509.15	509.55	509.05
15	508.95	509.15	509.55	509.25	509.05	509.25	509.05	509.15	509.05	509.15	509.45	508.95
16	508.95	509.15	509.45	509.15	509.05	509.25	509.05	509.05	509.05	*a*	509.45	508.95
17	508.95	509.15	509.25	509.05	509.05	509.25	509.05	508.95	509.05	509.15	509.45	508.85
18	508.95	509.15	509.15	509.15	509.15	509.85	509.05	509.05	509.05	509.15	509.25	*a*
19	509.65	509.05	508.85	509.25	509.75	509.65	509.15	509.25	509.05	509.05	509.25	508.95
20	509.55	509.15	509.85	509.55	509.35	509.45	509.05	509.15	509.05	509.05	*a*	508.95
21	509.45	509.15	510.15	509.25	510.75	509.35	509.05	509.05	509.05	509.05	509.25	509.05
22	510.35	509.45	509.95	509.25	509.55	509.35	509.05	509.05	509.05	509.35	509.25	508.95
23	510.35	509.25	510.05	509.15	509.45	509.25	509.05	508.95	508.95	*a*	509.25	509.05
24	510.25	509.25	509.85	509.15	509.35	509.25	509.05	509.15	509.05	509.25	509.35	509.35
25	509.65	509.25	510.55	509.15	510.65	509.25	509.05	509.05	*a*	509.65	509.45	*a*
26	509.45	509.15	510.25	509.75	509.75	509.15	509.05	509.25	509.15	509.45	509.45	509.25
27	509.35	509.25	509.85	509.35	509.55	509.05	508.85	509.15	509.05	509.65	*a*	509.15
28	509.35	511.25	509.85	509.25	509.45	509.15	509.85	509.05	509.85	509.55	509.35	509.25
29	509.25	.....	510.15	509.15	509.05	509.15	509.15	509.05	509.45	509.55	509.25	509.15
30	509.35	.....	509.85	509.15	509.35	509.15	509.15	509.05	509.25	*a*	509.25	509.05
31	509.25	.....	509.85	.....	509.55	.....	509.15	508.95	.....	509.35	.....	508.95

a No record.

MOHAWK RIVER NEAR DUNSBACH FERRY, N. Y.

This gaging record is kept at the dam of the West Troy Water Company, one-fifth mile above Dunsbach Ferry bridge, 9 miles from the mouth of the river. The dam is in two sections, situated on opposite sides of a Hudson river shale island. The left wing at the upper end of the island has a crest length of 380 feet. The right wing, 500 feet down-stream at the foot of the island, has a crest 280 feet long.

The record was established, March 12, 1898, for the primary purpose of checking a system of levels for the United States Board of Engineers on Deep Waterways, by D. J. Howell, C. E., who has furnished the earlier portion of the record. No record was kept from April 1, 1899, to August 1, 1900. During the period 1900–1907, the record was maintained under the direction of the United States Geological Survey in coöperation with this Department. During 1910 the record was maintained by this Department.

In the pumping station adjoining the dam there is one turbine of the old American type, 66 inches in diameter, also a new 54-inch Victor turbine, which was installed during 1902. The discharge is calculated from the recorded daily run of the water-wheels and working head. The turbines drive pumps, taking water from the river for water-supply purposes, the capacity of the pumps being 3,500,000 gallons per day, equivalent to a continuous flow of 5.4 second-feet.

The dam is of masonry, with a flat granite crest 5.5 feet wide. It was rebuilt in 1903, and a new profile obtained. The crest gage is attached to the timber cribbing 50 feet above the lower section of the dam, and is in three sections. Gage readings are taken twice daily at intervals of about 12 hours, by Robert Wilson. The mean of the two daily readings is used in computing the flow. The discharge over the main dam has been calculated by means of the weir formula, using coëfficients derived from the United States Geological Survey experiments.

During high water the current of the stream through the cross-section of the channel leading to the lower dam has a velocity of several feet per second. The head due to this velocity has been added to the observed head as a correction for velocity of approach to the lower dam. The upper dam is situated 450 feet up-stream from the crest gage.

Mean Daily Discharge, Second-feet, of Mohawk River at Dunsbach Ferry, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	1,411	4,411	......	15,031	*6,631	7,004	1,641	1,641	841	3,761	3,431	2,931
2	*1,181	3,761	......	15,371	5,701	6,501	1,761	1,641	841	*3,101	2,931	2,761
3	1,181	3,761	......	*14,691	6,421	5,524	*1,627	1,411	841	2,761	2,431	2,601
4	1,181	3,431	......	13,421	7,941	4,884	1,557	1,301	*1,301	2,101	2,101	2,431
5	1,411	3,101	......	10,079	11,551	*5,314	1,557	1,181	1,641	1,871	3,431	*2,101
6	1,521	*3,101	*40,682	9,477	9,281	7,764	1,437	1,641	1,981	1,641	*5,921	2,101
7	1,871	2,761	27,262	8,357	7,181	15,534	1,327	*3,431	2,431	1,411	6,681	2,101
8	1,871	2,601	34,442	8,397	*5,701	15,194	1,362	2,931	4,411	1,981	6,421	1,981
9	*2,601	2,601	28,121	7,681	4,841	13,244	1,362	1,981	6,171	*3,101	5,491	1,871
10	3,431	2,761	24,932	*7,431	4,621	9,664	*1,362	1,871	5,061	2,761	6,171	1,641
11	2,931	2,761	20,307	7,181	4,621	7,764	1,303	1,761	*3,261	2,101	8,191	*1,411
12	2,601	2,761	16,697	7,181	4,234	*10,224	1,432	1,761	1,981	1,871	9,841	1,301
13	2,431	*2,761	*13,421	7,631	3,804	12,624	1,332	4,841	1,521	1,641	*7,941	1,301
14	2,431	2,761	11,551	6,931	3,414	9,944	1,234	*4,841	1,411	1,641	5,921	1,411
15	2,101	2,601	10,681	5,701	*2,754	6,508	1,234	3,431	1,411	1,411	5,061	1,507
16	*2,101	2,431	9,281	4,841	2,584	5,617	1,234	2,431	1,181	*1,301	4,411	1,570
17	2,080	2,271	8,191	*4,621	2,534	4,977	*1,092	1,761	1,181	1,181	3,761	1,383
18	2,052	3,591	7,254	4,411	2,584	7,097	1,181	1,641	*1,066	1,066	3,591	*1,437
19	2,712	3,761	6,504	6,631	2,924	*10,597	1,066	1,521	951	1,066	3,101	1,510
20	4,572	*3,761	*5,612	12,171	3,584	9,197	951	1,411	951	1,301	*2,601	1,382
21	6,632	3,761	7,131	9,841	4,884	6,597	1,181	*1,301	951	1,521	2,101	1,383
22	12,801	5,061	14,601	8,721	*4,014	5,407	1,181	1,056	951	1,641	2,271	1,298
23	*52,981	7,941	14,041	7,131	4,441	4,107	1,181	951	841	*1,761	2,761	1,493
24	20,174	6,171	14,041	*5,921	5,524	3,219	*1,181	951	841	2,101	3,101	1,761
25	15,534	5,491	16,061	5,491	5,314	3,101	1,181	896	*896	2,431	3,431	*2,101
26	13,554	5,491	23,831	6,931	12,934	*2,761	1,301	951	1,066	2,761	3,431	2,431
27	11,064	*6,171	*21,031	27,481	10,784	2,761	1,401	951	1,981	3,101	*3,431	2,761
28	8,264	9,841	16,741	14,351	8,264	2,271	1,401	*951	3,761	3,531	3,431	2,761
29	7,004	......	14,691	10,681	*6,754	1,981	1,401	951	4,411	4,411	3,101	3,101
30	*5,744	......	14,351	7,941	5,524	1,761	1,641	951	3,981	*4,411	3,101	3,431
31	4,664	......	15,031	......	6,754	......	*1,871	951	......	3,981	......	4,841
Mean	6,518	3,988	16,797	9,396	5,748	6,972	1,356	1,784	2,004	2,283	4,320	2,068

* Sunday.

Monthly Discharge of Mohawk River at Dunsbach Ferry, N. Y.

[Drainage area, 3,440 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
January	52,961	1,181	6,518	1.89	2.18
February	9,841	2,271	3,988	1.16	1.21
March	40,682	5,612	16,797	4.88	5.63
April	27,481	4,411	9,396	2.73	3.05
May	12,934	2,584	5,748	1.67	1.92
June	15,534	1,761	6,972	2.03	2.26
July	1,871	951	1,356	0 394	0.454
August	4,841	895	1,784	0.519	0.598
September	6,171	841	2,004	0.583	0.650
October	4,411	1,066	2,283	0.664	0.766
November	9,841	2,101	4,320	1.26	1.41
December	4,841	1,298	2,068	0.601	0.693

MOHAWK RIVER AT REXFORD FLATS, N. Y.

A gage was established August 24, 1905, by this Department, above the State feeder dam at Rexford Flats. A box-and-chain gage is located on the right-hand, or south abutment of the dam, a few feet up-stream from the crest line. The elevation of water-surface, when the gage reads zero, is 208.16; standard chain length 10.75. Readings are taken each morning and afternoon by J. Reepmeyer, Jr. During the navigation season part of the flow of the Mohawk river is diverted to Erie canal through the Rexford Flats feeder.

The results of current-meter measurements made during 1910 to determine this diversion are presented herewith.

Estimates of discharge at this station for the years 1905 to 1910 are not available for publication at present.

The results of earlier gagings at Rexford Flats may be found in the Report of the State Engineer and Surveyor for 1902, supplement, pages 186–192.

Current-meter Discharge Measurements of Rexford Flats Feeder at Rexford Flats, N. Y.

DATE.	Hydrographer.	REFERENCE POINT READING.			Meter No.	Lateral interval.	Submergence depth.	Area flowing	Total area.	Total width.	Computed discharge.
		Beginning.	Ending.	Mean.							
1910.						*Feet.*		*Square feet.*	*Square feet.*	*Feet.*	*Second-feet*
June 16	Clark & Robbins.	16.05	16.05	16.05	462	2	0.6	122	122	34	240
June 24	Clark & Robbins.	15.93	15.93	15.93	462	2	0.6	130	130	34	242
Aug. 29	R. N. Barrett...	15.53	15.50	15.52	462	2	0.6	143	143	34	223
Sept. 14	R. N. Barrett...	15.70	15.70	15.70	462	2	0.6	147	147	34	255
Sept. 26	R. N. Barrett...	15.90	16.20	16.05	462	2	0.6	120	120	34	238

MOHAWK RIVER AT TRIBES HILL, N. Y.

This gaging station, which is located at the suspension bridge over the Mohawk river between Fort Hunter and Tribes Hill, was established April 3, 1904, by E. A. Lamb of this Department in coöperation with the U. S. Weather Bureau. The gage was formerly a vertical board attached to the down-stream end of the north abutment of the supension bridge. It is graduated in feet and tenths and the elevation of zero was 267.71 till May 26, 1909, after which the zero was changed to 267.75. A standard box-and-chain gage was used during 1910.

The elevation of bench-mark, marked " U. S. Weather Bureau Tablet No. 13," set in second course of the northeast anchorage of this bridge, is 295.021. Observations of the stage of the stream were taken twice each day during 1910 by R. S. Marshall.

Current-meter measurements are taken from the down-stream side of the suspension bridge, which is 535.6 feet long between abutments. The channel of the river is straight for some distance each way from the bridge, and the cross-section directly under the bridge and below the bridge is quite uniform. About 300 feet above the bridge rapids are formed during low water, the river being shallow and having a rough and stony bed.

This gaging station is located about 1,000 feet below the junction of the Mohawk river and Schoharie creek, and the record here will show the combined discharge of these streams.

Beginning in 1907 the conditions at this station have been modified by construction work for the Barge canal, in progress near by. The calculated discharge for these years is approximate only.

Mean Daily Discharge Second-feet, of Mohawk River at Tribes Hill, N. Y.

DAY.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1904.									
1	......	28,700	4,600	960	1,520	2,575	18,750	3,420	4,300
2	......	25,300	4,300	1,300	1,775	3,420	16,800	2,300	3,700
3	44,300	20,800	3,420	1,300	1,520	4,000	8,650	1,775	3,700
4	39,301	8,750	2,575	1,520	1,120	5,250	6,275	1,520	3,700
5	26,525	16,800	2,850	1,120	960	5,250	5,250	3,700	3,700
6	30,600	18,750	4,000	960	960	5,250	5,600	2,575	3,700
7	36,250	12,100	4,300	960	960	4,950	5,250	2,575	3,700
8	34,600	11,600	4,950	960	960	4,000	2,850	2,300	3,700
9	34,600	10,050	11,100	960	960	4,300	2,575	2,300	3,700
10	28,700	7,400	20,100	1,300	840	4,000	4,300	2,300	3,700
11	29,600	6,275	11,600	1,120	840	3,700	6,275	2,025	3,700
12	26,950	5,250	6,650	1,120	840	2,575	15,000	2,025	2,850
13	20,800	4,950	5,600	960	840	1,520	13,250	2,025	2,850
14	16,200	4,000	4,600	960	960	960	9,100	2,300	2,850
15	18,750	5,600	4,000	960	960	1,120	6,650	2,300	2,850
16	21,100	7,400	3,700	710	840	1,775	4,950	2,025	2,850
17	20,100	8,250	3,420	840	840	1,300	4,600	2,300	2,850
18	18,750	7,800	2,850	840	1,120	1,300	4,300	2,025	2,850
19	18,100	7,400	2,300	840	960	1,300	4,300	1,775	2,850
20	17,500	10,600	1,520	840	1,775	1,300	4,300	2,025	2,850
21	7,400	11,100	1,300	840	14,400	1,520	14,400	2,850	2,850
22	7,400	6,275	1,300	840	15,600	3,125	*a*	5,250	3,700
23	7,400	5,925	1,120	960	18,100	4,300	*a*	3,700	3,700
24	7,000	5,600	960	1,120	12,650	5,250	28,700	3,700	3,700
25	12,650	5,600	960	960	7,400	5,925	7,800	3,700	3,700
26	18,100	5,600	960	1,120	7,400	9,600	7,800	3,420	3,700
27	22,300	5,925	960	1,120	6,650	10,050	7,000	3,125	4,000
28	28,700	7,400	960	960	6,275	8,650	5,925	3,125	33,600
29	34,600	6,650	960	1,300	5,600	5,925	5,600	3,420	19,450
30	30,600	5,250	1,120	960	5,250	7,800	4,950	3,700	12,100
31	......	4,950	......	1,300	4,950	......	4,000	......	11,600
Mean	23,496	9,937	3,968	1,036	4,059	4,066	8,110	2,719	5,453

Mean Daily Discharge, Second-feet, of Mohawk River at Tribes Hill, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1905.												
1.	11,600	7,800	8,250	*a*	10,600	630	3,420	6,275	3,700	2,300	3,700	15,600
2.	11,600	8,650	7,800	*a*	9,600	710	1,520	4,300	3,125	2,025	7,000	7,400
3.	16,200	8,650	7,800	43,100	11,600	840	5,925	2,850	8,250	2,850	6,275	30,600
4.	16,800	8,250	7,800	36,800	12,100	1,120	18,100	2,300	28,700	3,700	5,600	43,100
5.	11,600	4,950	7,000	20,800	11,600	1,300	11,100	2,025	36,800	3,420	5,600	20,800
6.	11,600	7,000	7,800	31,600	13,250	1,520	8,250	2,575	27,800	2,850	5,600	14,400
7.	11,600	4,950	7,800	19,450	7,400	2,025	6,275	4,300	16,200	2,300	6,650	11,600
8.	16,200	7,000	8,650	16,800	6,275	2,575	3,700	4,950	11,100	1,520	10,050	8,650
9.	18,100	7,000	8,250	17,500	6,275	4,000	3,700	2,850	6,650	1,520	9,100	7,000
10.	13,250	7,000	7,800	15,000	6,650	5,925	3,700	2,025	5,250	1,120	6,650	5,925
11	9,600	7,000	7,800	15,000	5,925	5,600	2,300	1,775	3,700	1,300	5,600	5,925
12.	9,600	7,000	7,800	18,750	5,250	5,600	2,575	1,775	4,000	5,600	4,950	3,700
13.	19,450	7,000	8,250	26,100	3,700	5,250	3,125	3,125	5,925	10,050	4,950	3,700
14.	17,500	7,000	8,650	18,100	3,700	4,300	2,575	4,300	5,600	10,050	4,950	3,700
15.	17,500	7,000	8,650	16,200	2,850	3,700	4,600	4,950	3,700	7,400	4,300	3,700
16.	17,500	7,000	8,650	14,400	4,600	2,575	4,000	10,600	3,420	4,950	4,000	3,700
17.	17,500	7,000	10,050	12,100	3,700	2,300	2,300	10,600	3,700	3,700	3,700	3,700
18.	17,500	7,800	9,600	8,250	3,700	2,575	2,300	8,250	6,275	3,125	3,700	3,700
19.	17,500	7,800	*a*	6,650	3,420	3,700	2,300	4,600	13,250	3,700	3,700	3,700
20.	14,400	8,250	*a*	7,000	3,420	6,650	3,700	3,125	11,600	10,050	3,700	3,700
21.	12,100	8,250	*a*	7,000	3,700	7,400	3,125	2,300	11,100	10,600	2,850	4,950
22.	11,600	8,250	*a*	9,600	3,700	12,650	2,575	1,775	8,650	9,100	2,575	13,800
23.	14,400	8,250	*a*	10,600	3,700	20,100	2,300	1,775	5,925	5,925	2,300	11,100
24.	11,600	8,250	*a*	11,600	2,025	13,250	2,300	1,520	4,600	5,250	2,300	8,250
25.	11,600	8,250	*a*	8,250	2,300	9,100	2,300	1,120	3,700	4,300	2,575	7,400
26.	11,600	8,250	*a*	7,800	2,300	10,050	2,300	1,120	3,700	3,700	3,700	5,250
27.	11,600	8,250	*a*	7,000	960	11,600	2,300	1,120	3,125	3,700	3,420	3,700
28.	11,600	8,250	*a*	7,000	1,120	12,650	2,300	1,120	2,300	3,125	3,420	4,300
29.	11,600	......	*a*	7,800	840	11,600	2,300	1,120	2,300	3,125	3,420	4,600
30.	11,600	......	*a*	12,100	840	11,600	1,300	1,300	2,300	2,575	16,800	9,100
31.	11,600	......	*a*	......	575	......	2,575	2,850	......	2,300	......	8,250
Mean.	13,790	7,504	8,244	15,441	5,086	6,097	3,908	3,376	8,548	4,427	5,104	9,194

a Exceeds limits of rating curve.

Mean Daily Discharge, Second-feet, of Mohawk River at Tribes Hill, N. Y.

AY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1906.												
1.	7,400	4,775	7,000	16,800	5,250	4,950	3,125	2,300	1,775	1,120	2,575	5,600
2.	5,100	4,000	6,650	12,950	5,600	3,700	6,650	1,775	1,520	1,120	2,575	4,600
6.	4,150	3,700	6,462	10,600	15,000	2,850	6,275	1,120	1,120	840	2,025	3,700
4.	4,450	3,700	37,400	10,600	15,000	2,575	5,250	1,120	1,120	840	2,575	3,700
5.	7,000	3,700	14,400	15,000	12,100	2,300	5,250	1,520	1,120	710	1,520	3,700
6	7,000	3,700	11,100	16,800	8,650	2,575	3,700	2,300	840	710	1,775	3,700
7.	5,250	3,700	10,600	15,000	7,000	2,850	2,850	2,300	840	840	2,025	3,700
8	5,250	3,700	6,650	11,600	6,275	2,575	2,300	2,025	840	960	1,520	3,700
9.	3,700	3,700	5,600	9,100	4,950	2,300	1,775	2,025	630	1,120	1,120	7,000
10.	3,700	3,700	5,425	10,600	5,600	5,250	1,775	1,520	630	2,025	1,120	7,000
11.	3,700	3,420	5,250	20,800	5,250	4,950	4,000	1,120	630	2,300	1,520	6,275
12.	4,450	3,420	4,600	24,500	4,950	3,700	5,250	960	550	2,575	2,300	5,600
13.	5,250	4,150	4,300	20,100	3,700	3,420	2,575	840	550	2,300	2,575	4,950
14.	5,250	3,700	3,700	25,300	3,700	2,300	2,025	840	550	1,520	3,125	5,250
15.	5,250	3,700	3,700	39,300	3,700	2,300	1,520	840	550	2,025	2,575	4,300
16.	5,250	3,700	3,700	*a*	4,300	2,300	1,120	630	550	1,775	2,300	13,250
17.	5,250	3,700	3,700	29,600	3,700	5,600	960	550	550	1,520	3,700	11,600
18.	5,250	3,700	3,420	24,500	3,700	8,650	1,120	550	550	1,120	3,420	12,100
19.	3,700	3,700	2,575	20,800	3,700	7,000	1,120	630	550	1,120	5,600	11,600
20.	4,300	3,700	2,575	17,500	3,700	4,300	960	630	550	1,520	16,200	11,600
21.	4,300	3,700	2,575	16,800	2,850	3,420	840	630	550	2,025	12,650	11,600
22.	11,100	21,150	2,575	16,800	2,300	2,575	840	840	630	2,300	12,650	11,600
23.	23,000	17,500	2,575	16,800	2,025	3,420	840	960	1,120	2,575	8,650	10,600
24.	39,300	11,100	2,575	12,100	2,025	3,125	840	1,120	1,520	2,300	7,000	7,000
25.	26,525	......	2,575	10,050	2,300	2,575	840	1,120	1,520	2,025	6,275	7,000
26.	15,600	......	1,900	7,000	2,025	2,300	840	1,120	1,120	2,025	5,250	7,000
27.	11,600	......	7,000	6,275	11,600	2,300	840	1,520	1,520	2,025	5,250	7,000
28.	8,025	......	43,700	5,600	18,750	1,775	840	1,520	1,775	2,850	5,600	7,000
29.	5,925	......	28,700	5,600	18,750	1,775	1,120	2,025	2,025	2,850	7,000	3,700
30.	4,000	......	22,650	5,250	11,600	1,520	960	2,575	2,025	2,575	5,925	3,700
31.	4,000	......	28,700	......	5,925	......	1,520	2,575	......	2,575	......	7,000
Mean.	8,194	5,363	9,495	15,646	6,644	3,374	2,255	1,342	994	1,748	4,613	6,972

a Exceeds limits of rating curve.

Mean Daily Discharge, Second-feet, of Mohawk River at Tribes Hill, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1......	28,700	4,300	2,025	20,100	13,250	2,850	1,520	1,300	630	7,400	6,275	4,000
2......	20,100	4,300	2,300	12,650	15,000	2,575	3,125	1,120	630	4,950	5,250	3,700
3......	16,200	4,000	2,300	9,100	10,050	3,125	4,950	1,120	710	3,125	13,800	3,700
4......	43,100	4,000	2,300	7,400	10,050	4,300	3,125	2,300	840	4,950	13,250	3,125
5......	44,300	4,000	2,025	7,400	12,100	3,420	2,025	1,520	5,250	11,100	11,100	2,850
6......	29,600	3,700	2,850	8,650	9,600	4,950	1,300	1,300	4,300	8,250	8,650	2,300
7......	17,500	3,125	2,850	7,400	9,100	8,650	1,300	1,120	2,850	5,925	*a*	2,850
8......	21,500	2,575	2,850	5,925	9,100	7,800	1,300	1,120	3,420	8,250	40,600	2,575
9......	18,100	2,300	2,575	5,600	8,250	5,600	1,120	1,120	2,025	16,200	23,750	3,125
10......	11,100	2,300	2,300	5,925	7,000	3,420	1,120	1,120	2,025	12,100	16,800	21,500
11......	9,100	2,300	2,300	5,250	7,400	3,125	1,300	1,120	1,775	9,100	12,100	41,900
12......	6,650	2,025	2,025	7,400	7,000	2,850	2,575	840	9,600	8,250	8,650	20,100
13......	5,600	2,025	2,300	8,250	5,925	2,575	2,850	630	9,100	7,800	7,000	14,400
14......	5,250	1,775	5,600	11,100	5,250	2,300	2,300	630	4,950	6,275	5,925	9,600
15......	5,600	2,025	23,750	9,100	4,950	2,025	1,775	1,120	3,125	4,950	5,250	7,800
16......	5,250	2,300	16,800	6,650	4,300	1,775	1,300	960	2,300	4,300	4,950	7,000
17......	4,950	2,300	16,800	6,650	4,300	2,300	1,120	960	2,575	3,700	4,600	6,650
18......	4,950	2,300	22 300	6,275	4,600	2,025	2,300	710	2,025	3,420	4,000	5,925
19......	5,250	2,575	22,600	5,600	4,300	2,025	2,025	630	1,520	2,850	3,700	5,600
20......	13,800	2,575	33,600	5,250	4,300	1,775	1,520	630	1,520	2,575	3,420	4,600
21......	11,600	2,300	39,300	4,600	4,000	1,775	1,775	840	1,520	2,575	3,700	4,600
22......	10,050	2,300	39,300	4,300	3,700	1,775	1,520	1,120	2,025	3,125	4,300	4,600
23......	8,650	2,025	31,600	4,950	2,850	1,775	1,120	630	2,300	2,850	4,300	4,300
24......	6,650	2,025	32,600	25,300	2,575	1,520	1,120	630	2,300	2,575	4,000	33,600
25......	4,950	2,025	22,300	20,800	2,300	1,520	1,775	630	4,000	2,575	3,700	22,300
26......	4,300	1,775	19,450	19,450	2,300	1,520	2,850	630	2,850	2,025	3,700	17,500
27......	4,300	2,025	16,800	30,600	5,250	1,775	2,300	630	2,575	1,775	4,000	13,250
28......	4,300	2,025	25,300	19,450	6,650	1,520	1,775	630	3,125	3,700	3,700	16,800
29......	4,300	......	32,600	15,600	5,925	1,520	1,300	630	4,000	22,300	4,600	19,450
30......	4,300	......	32,600	11,100	4,000	1,520	1,120	630	7,800	15,000	5,600	13,250
31......	4,300	......	29,600	......	2,850	......	1,300	710	......	9,100	......	16,200
Mean...	12,397	2,618	16,255	10,594	6,394	2,856	1,867	938	3,122	6,551	8,299	10,940

a Exceeds limits of rating curve.

Mean Daily Discharge, Second-feet, of Mohawk River at Tribes Hill, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
1......	11,850	3,125	3,560	16,800	22,300	7,600	840	840	575	1,210	1,775	2,162
2......	9,825	4,600	3,560	14,100	22,650	7,000	840	840	575	1,040	1,120	2,988
3......	6,825	5,600	4,150	12,100	18,100	5,100	840	710	575	960	1,040	2,438
4......	5,600	5,762	4,450	10,850	13,250	3,560	775	630	575	840	1,120	1,648
5......	4,300	5,925	5,100	7,200	9,825	2,988	900	710	575	710	1,040	1,410
6......	4,000	6,275	5,600	9,350	7,400	2,712	960	670	575	710	960	1,648
7......	4,600	6,650	5,100	12,650	8,250	2,300	1,040	900	575	710	900	1,210
8......	4,300	6,100	4,600	14,100	26,525	1,900	1,040	1,300	630	710	960	2,025
9......	4,300	5,250	4,600	28,250	19,405	1,900	1,040	1,210	630	670	840	3,560
10......	4,150	5,425	4,950	20,800	15,300	2,438	1,520	960	575	630	960	3,850
11......	4,000	5,600	5,100	18,425	11,600	2,575	1,040	840	575	630	1,210	3,125
12......	3,560	5,762	6,825	16,800	8,875	2,162	960	710	562	775	1,648	2,162
13......	5,250	6,100	14,700	14,100	6,825	1,775	960	710	550	900	2,850	2,850
14......	7,000	6,275	29,600	11,100	8,450	1,520	775	710	550	960	2,575	2,575
15......	6,462	22,650	27,800	9,825	11,850	1,520	840	670	550	840	2,025	2,300
16......	5,925	*a*	34,100	15,300	8,875	1,775	710	630	550	840	1,300	2,712
17......	5,100	34,600	20,800	12,100	7,000	2,300	710	710	550	710	1,300	3,560
18......	4,150	23,750	14,700	9,600	6,825	2,025	900	7,400	550	670	1,120	3,850
19......	4,000	14,400	12,100	11,600	5,762	1,648	6,100	2,850	550	630	1,120	3,560
20......	3,850	10,050	10,325	13,525	5,425	1,410	6,100	1,900	550	630	1,410	2,300
21......	2,988	9,100	7,800	11,350	4,450	2,850	4,000	1,120	550	630	1,775	2,025
22......	3,272	8,650	7,600	9,100	4,150	2,575	2,162	960	550	630	2,300	2,025
23......	6,275	6,650	10,850	7,600	10,325	1,648	2,988	840	550	630	2,025	2,025
24......	5,100	5,600	20,450	8,450	7,600	1,300	2,300	710	550	630	2,162	2,025
25......	4,150	4,775	20,450	11,600	5,600	1,410	1,900	630	550	575	2,850	1,900
26......	3,272	4,300	15,000	13,250	4,950	1,210	1,775	630	550	575	3,420	1,775
27......	2,850	7,200	25,700	13,525	5,600	1,040	1,775	630	550	630	4,300	1,775
28......	2,988	7,200	24,500	14,400	5,600	960	1,648	630	550	960	3,560	2,300
29......	3,420	3,700	41,900	15,000	4,300	840	1,300	630	602	775	2,850	2,300
30......	3,272	......	31,100	10,850	4,000	710	1,120	575	1,120	525	1,900	3,272
31......	2,988	......	22,650	......	5,250	......	960	575	..	550	......	1,648
Mean...	4,826	8,610	14,507	13,123	9,883	2,358	1,639	1,091	584	738	1,814	2,419

a Exceeds limits of rating curve.

Mean Daily Discharge, Second-feet, of Mohawk River at Tribes Hill, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1......	1,520	6,100	12,100	15,900	20,100	3,850	1,648	900	670	900	1,775	3,500
2......	3,272	5,600	9,600	16,500	27,800	3,560	1,410	900	670	900	1,648	3,856
3......	2,438	4,775	8,875	18,100	20,450	3,272	1,410	900	670	960	1,648	3,420
4......	2,025	4,775	8,025	21,150	20,100	2,850	1,648	775	670	1,210	1,648	2,850
5......	2,300	4,450	7,400	20,800	16,800	2,712	1,648	775	670	1,210	1,900	2,438
6......	15,000	14,400	5,600	21,150	15,300	6,275	1,648	775	670	960	1,648	2,438
7......	17,150	16,800	4,775	21,500	16,800	7,600	1,410	670	900	840	1,410	2,575
8......	13,525	14,700	4,300	41,250	15,300	5,600	1,210	602	1,210	775	1,410	2,575
9......	12,100	15,300	4,600	34,600	12,650	4,150	1,210	602	1,210	775	1,410	2,988
10......	9,100	12,950	8,025	26,525	11,100	3,272	900	602	1,040	775	1,648	3,272
11......	7,200	10,850	14,100	18,425	22,650	4,450	775	602	1,040	775	1,900	2,025
12......	7,000	7,600	12,100	13,525	19,100	6,825	670	602	1,040	775	1,900	1,648
13......	6,825	6,800	11,100	11,100	14,700	5,925	602	602	1,040	775	1,900	1,648
14......	6,650	4,600	7,800	23,000	10,325	6,650	602	602	900	775	1,900	2,025
15......	6,275	7,600	6,275	*a*	8,025	5,925	602	602	775	775	1,900	2,575
16......	6,275	8,450	5,762	*a*	7,800	4,775	602	602	775	775	1,900	2,988
17......	5,762	10,600	5,250	28,700	12,375	4,000	1,648	840	775	775	1,900	3,272
18......	5,425	10,325	4,450	22,650	11,100	5,100	900	3,272	775	775	2,162	3,560
19......	5,250	8,250	3,850	21,900	8,650	6,825	900	3,850	775	2,162	2,162	3,420
20......	4,775	*a*	4,300	20,450	7,400	5,425	900	2,850	775	2,438	2,850	3,560
21......	4,600	*a*	4,150	21,150	6,100	4,450	900	2,438	775	1,900	3,272	3,700
22......	4,450	23,000	4,450	16,500	5,600	3,700	900	2,162	775	1,900	3,272	3,700
23......	4,300	19,775	4,950	14,700	5,425	3,125	900	1,648	775	3,272	3,560	3,560
24......	9,100	27,800	5,250	14,100	5,100	2,988	4,000	1,040	775	4,950	5,425	3,850
25......	29,150	36,800	5,925	11,600	4,600	2,712	4,600	775	900	4,300	5,425	4,450
26......	20,100	22,650	29,150	10,325	4,600	2,448	4,150	670	900	3,700	4,950	4,775
27......	18,100	18,100	14,700	9,600	4,000	2,162	3,272	670	900	2,988	3,850	5,100
28......	15,300	16,200	15,900	11,850	4,950	1,900	2,712	670	900	2,300	3,560	5,100
29......	11,100	......	15,300	11,850	5,600	1,775	2,162	670	900	1,900	4,000	4,450
30......	8,875	......	14,700	12,950	5,250	1,900	1,410	670	900	1,900	4,450	4,150
31......	7,800	......	15,600	......	4,450	......	1,210	670	......	1,648	......	3,850
Mean..	8,798	13,433	8,979	18,995	11,426	4,207	1,566	1,129	852	1,641	2,613	3,335

a Exceeds limits of rating curve.

Mean Daily Discharge, Second-feet, of Mohawk River at Tribes Hill, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	3,850	*a*	*a*	20,450	7,600	7,200	1,775	1,648	840	4,150	3,125	3,125
2......	3,850	*a*	*a*	18,100	8,875	5,925	1,520	1,210	840	3,125	2,712	2,712
3......	3,850	*a*	*a*	16,200	9,600	5,425	1,300	1,120	840	2,575	2,575	2,575
4......	3,560	*a*	*a*	15,900	12,650	4,950	1,210	1,520	1,775	1,775	2,162	2,712
5......	3,272	*a*	*a*	14,100	10,600	5,425	1,300	1,520	1,775	1,775	3,700	2,162
6......	3,272	*a*	*a*	12,650	9,350	16,800	1,300	4,775	3,575	1,775	6,650	2,025
7......	3,125	*a*	*a*	12,950	8,025	18,750	1,300	3,420	4,300	1,775	7,400	1,900
8......	4,150	*a*	*a*	12,650	7,000	16,800	1,120	2,300	4,450	2,438	6,275	2,025
9......	5,250	*a*	*a*	11,100	7,200	11,850	1,410	2,025	3,700	2,988	5,425	1,775
10......	5,925	*a*	14,400	9,825	7,400	8,250	1,775	1,900	1,775	2,850	7,000	2,025
11......	6,462	*a*	13,250	9,350	7,800	8,650	1,410	2,438	1,040	2,575	11,350	1,520
12......	6,825	*a*	10,600	8,875	7,400	12,375	1,300	4,775	840	2,300	10,325	1,520
13......	7,200	*a*	11,350	7,800	7,200	11,100	1,900	4,300	840	1,520	8,650	1,300
14......	6,825	*a*	10,600	7,200	6,650	8,650	2,162	2,850	840	1,520	6,825	1,300
15......	6,275	*a*	8,250	7,000	5,250	6,825	1,775	1,900	900	1,300	6,275	1,300
16......	6,100	*a*	7,800	5,925	4,000	6,462	1,120	1,775	960	1,210	4,775	1,300
17......	6,100	*a*	6,100	4,950	2,850	5,925	1,120	1,520	1,410	840	4,300	1,520
18......	6,462	*a*	4,950	7,000	2,712	7,400	960	1,520	1,300	900	3,850	1,520
19......	6,825	*a*	5,925	10,050	4,150	11,350	960	1,300	1,120	840	3,700	1,520
20......	11,850	*a*	9,350	14,700	5,425	8,650	1,120	1,300	840	840	2,988	1,520
21......	15,000	*a*	18,750	11,600	4,950	6,650	960	1,300	840	840	2,575	1,520
22......	19,100	*a*	15,600	8,025	5,762	5,250	930	1,120	840	960	2,300	1,520
23......	*a*	*a*	13,250	6,650	5,250	4,450	960	1,120	840	1,120	2,438	1,520
24......	*a*	*a*	19,100	5,762	5,425	3,420	960	1,040	840	1,300	2,300	2,025
25......	*a*	*a*	22,300	5,425	7,000	2,988	960	900	960	1,300	2,162	2,575
26......	*a*	*a*	27,375	20,800	17,800	2,575	1,210	840	2,300	1,775	2,988	2,438
27......	*a*	*a*	23,750	27,800	12,100	2,438	1,210	840	5,425	2,300	4,150	2,300
28......	*a*	*a*	20,100	13,800	10,325	2,438	1,300	840	8,025	3,560	4,150	2,162
29......	*a*	......	18,100	8,450	8,875	2,162	1,120	840	10,850	4,775	3,850	2,438
30......	*a*	......	17,500	7,800	7,200	1,775	3,125	840	8,875	4,000	3,700	2,575
31......	*a*	......	18,750	......	7,800	......	2,025	840	......	3,560	......	2,575
Mean..	6,597	*a*	14,416	11,430	7,556	7,430	1,375	1,795	2,458	2,083	4,689	1,968

a No record.

Monthly Discharge of Mohawk River at Tribes Hill, N. Y.

[Drainage area, 3,113 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1904.					
April	44,300	7,000	23,496	7.54	8.41
May	25,300	4,000	9,937	3.19	3.68
June	20,100	960	3,968	1.27	1.42
July	1,300	840	1,036	0.332	0.383
August	18,100	840	4,059	1.30	1.50
September	10,050	960	4,066	1.30	1.45
October	18,750	2,575	8,110	2.60	3.00
November	3,700	1,520	2,719	0.906	1.01
December	33,600	2,850	5,453	1.75	2.02
1905.					
January	19,450	9,600	13,790	4.43	5.107
February	8,650	4,950	7,504	2.41	2.510
March	*a* 10,050	7,000	8,244	2.65	3.055
April	*a* 43,100	6,650	15,441	4.96	5.534
May	13,250	575	5,086	1.63	1.879
June	20,100	630	6,097	1.96	2.187
July	18,100	1,300	3,908	1.26	1.453
August	10,600	1,120	3,376	1.08	1.245
September	36,800	2,300	8,548	2.75	3.068
October	10,600	1,120	4,427	1.42	1.637
November	16,800	2,300	5,104	1.64	1.830
December	43,100	3,700	9,194	2.95	3.401
1906.					
January	39,300	3,700	8,194	2.63	3.03
February	21,150	3,420	5,363	1.72	1.79
March	43,700	1,900	9,495	3.05	3.52
April	*a* 39,300	5,250	15,646	5.03	5.61
May	18,750	2,025	6,644	2.13	2.46
June	8,650	1,520	3.374	1.08	1.20
July	6,650	840	2,255	0.724	0.835
August	2,575	550	1,342	0.431	0.497
September	2,025	550	994	0.319	0.356
October	2,850	710	1,748	0.562	0.648
November	16,200	1,120	4,613	1.48	1.65
December	13,250	3,700	6,972	2.24	2.58
1907.					
January	44,300	4,300	12,397	3.98	4.59
February	4,300	1,775	2,618	0.841	0.876
March	39,300	2,025	16,255	5.22	6.02
April	30,600	4,300	10,594	3.40	3.79
May	15,000	2,300	6,394	2.05	2.36
June	8,650	1,520	2,856	0.917	1.02
July	4,950	1,120	1,867	0.600	0.692
August	2,300	630	938	0.301	3.47
September	7,600	630	3,122	1.00	1.12
October	22,300	1,775	6,551	2.10	2.32
November	*a*40,600	3,420	8,299	2.67	2.98
December	41,900	2,300	10,940	3.51	4.05
1908.					
January	11,850	2,850	4,826	1.55	1.79
February	*a*34,600	3,125	8,610	2.77	2.99
March	41,900	3,560	14,507	4.66	5.37
April	28,250	7,200	13,123	4.22	4.71
May	26,525	4,000	9,883	3.17	3.66
June	7,600	710	2,358	0.757	0.845
July	6,100	710	1,639	0.527	0.608
August	7,400	575	1,091	0.350	0.404
September	1,120	550	584	0.188	0.210
October	1,210	525	738	0.237	0.273
November	4,300	840	1,814	0.583	0.650
December	3,850	1,210	2,419	0.777	0.896

a Highest recorded discharge; maximum exceeds limits of rating curve.

Monthly Discharge of Mohawk River at Tribes Hill, N. Y—(Continued).
[Drainage area, 3,113 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1909.					
January	29,150	1,520	8,798	2.83	3.26
February	36,800	4,450	13,433	4.32	4.50
March	29,150	3,850	8,979	2.88	3.32
April	*a* 41,250	9,600	18,995	6.10	6.81
May	27,800	4,000	11,426	3.67	4.23
June	7,600	1,775	4,207	1.35	1.51
July	4,600	602	1,566	0.503	0.580
August	3,850	602	1,129	0.363	0.418
September	1,210	670	852	0.274	0.306
October	4,950	775	1,641	0.527	0.608
November	5,425	1,410	2,613	0.839	0.936
December	5,100	1,648	3,335	1.07	1.23
1910.					
January	19,100	3,125	6,597	2.12	2.44
February	*b*	*b*	*b*	*b*	*b*
March	27,375	4,950	14,416	4.63	5.34
April	27,800	4,950	11,430	3.67	4.10
May	17,800	2,712	7,556	2.43	2.80
June	18,750	1,775	7,430	2.39	2.67
July	3,125	960	1,375	0.442	0.510
August	4,775	840	1,795	0.577	0.665
September	10,850	840	2,458	0.789	0.880
October	4,775	840	2,083	0.669	0.771
November	11,350	2,162	4,689	1.51	1.68
December	3,125	1,300	1,968	0.632	0.729

a Highest recorded discharge; maximum exceeds limits of rating curve. *b* No record.

MOHAWK RIVER AT FULTONVILLE BRIDGE, FONDA, N. Y.

This gaging station was established April 29, 1906, by R. H. Merrill, for this Department. A box-and-chain, reading decimally from zero to 12 feet, is located on the down-stream guard-rail of the middle span of the bridge. The stream channel is straight and the river uniform for about one-half mile above and below the bridge. The river becomes ice covered in winter, but the conditions are generally good for current-meter measurements. The bridge comprises three spans and is subdivided to five-foot intervals on the down-stream side, the initial point being at the face of the left-hand abutment.

Current-meter Discharge Measurement of Mohawk River at Fonda, N. Y.

DATE.	Hydrographer.	GAGE READING			Meter No.	Lateral interval.	Submergence depth.	Area flowing.	Total area.	Total width.	Computed discharge.
		Beginning.	Ending.	Mean.							
						Feet.		*Square feet.*	*Square feet.*	*Feet.*	*Second-feet.*
1910. March 5	J. P. Newton	12.5	12.5	12.5	214	10	6/10	4,055.4	4,055.4	358.5	29,144.46

Mean Daily Discharge, Second-feet, of Mohawk River at Fonda, N. Y.

DAY.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1906.									
1	......	5,250	3,208	4,680	2,700	836	......	3,036	4,680
2	......	4,680	2,700	6,280	2,206	1,100	......	2,534	3,746
3	......	12,584	2,368	5,450	1,726	500	......	2,048	3,560
4	......	12,900	2,048	4,310	1,562	836	......	1,890	3,746
5	......	10,120	2,048	4,120	2,048	836	......	1,726	3,036
6	......	8,436	2,048	4,310	3,036	836	......	1,562	4,860
7	......	6,720	2,368	4,120	2,534	836	1,100	1,562	6,720
8	......	5,250	2,368	2,206	2,700	836	1,890	1,562	8,436
9	......	5,250	2,868	2,048	2,206	......	2,048	1,562	6,940
10	......	5,050	4,500	3,932	1,890	......	1,726	1,562	5,450
11	......	5,050	4,500	6,060	1,726	......	2,048	1,726	5,450
12	......	4,500	3,932	4,860	1,404	......	2,700	1,890	5,650
13	......	......	2,700	3,384	1,404	......	2,368	3,036	5,450
14	......	......	2,368	2,368	1,404	......	1,726	3,036	4,860
15	......	......	2,048	2,206	1,404	......	1,404	2,534	5,050
16	......	......	2,206	1,890	1,100	726	1,404	2,700	13,820
17	......	......	3,746	1,726	968	638	1,404	2,048	12,900
18	......	......	5,450	2,048	726	638	1,252	2,206	11,920
19	......	......	4,500	1,890	726	638	1,252	6,940	10,120
20	......	......	3,384	1,726	726	638	1,404	11,920	6,940
21	......	......	2,700	1,726	836	726	5,250	8,436	5,450
22	......	......	2,368	1,404	1,100	836	5,650	8,980	5,250
23	......	......	2,368	1,404	1,252	968	3,384	7,650	5,850
24	......	......	2,368	1,562	1,252	1,404	2,368	6,060	6,720
25	......	......	2,368	1,404	1,100	1,726	2,048	5,450	7,410
26	......	......	2,368	1,252	836	1,404	2,700	3,932	8,436
27	......	10,720	2,048	1,252	1,100	1,252	2,700	3,932	5,450
28	......	13,200	1,726	1,252	1,404	1,404	2,868	5,250	5,250
29	6,060	9,556	1,726	1,252	1,562	1,252	2,700	6,500	4,860
30	4,860	5,250	1,726	1,726	1,726	......	3,208	5,850	4,310
31	......	3,932	......	2,368	1,100	......	3,208	......	4,500
Mean	......	7,556	2,771	2,781	1,531	948	2,392	3,971	6,349

Mean Daily Discharge, Second-feet, of Mohawk River at Fonda, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	30,450	......	......	16,700	11,344	3,036	......	1,100	500	6,060	4,500	3,746
2	24,090	......	4,500	11,344	11,040	2,700	3,746	1,100	500	4,120	3,384	3,384
3	22,980	......	......	7,910	9,556	2,700	4,500	2,048	638	2,700	6,940	3,036
4	*a*	......	......	6,500	7,650	2,700	3,036	2,048	836	5,650	10,400	2,368
5	*a*	6,500	......	6,280	......	2,368	2,048	1,562	4,120	8,980	10,120	3,036
6	28,100	......	......	7,170	8,436	3,746	1,726	1,100	4,310	6,940	6,500	3,560
7	15,920	......	......	......	7,170	7,170	1,404	1,100	2,700	5,250	*a*	2,368
8	19,400	......	4,310	5,050	6,500	6,940	1,404	1,100	2,048	7,910	27,500	2,368
9	13,820	......	......	5,250	5,050	4,500	1,252	836	1,726	15,560	17,980	2,368
10	8,708	......	......	5,250	4,860	3,384	1,252	836	1,726	11,344	12,900	12,584
11	6,500	......	......	4,860	4,680	3,036	1,100	726	3,036	8,170	8,170	25,810
12	5,450	......	......	6,940	......	3,036	1,890	836	10,120	7,170	6,500	14,480
13	......	......	3,932	7,910	5,250	2,700	2,206	638	8,436	6,720	5,450	10,720
14	4,500	......	4,500	......	4,500	2,368	2,048	726	4,500	5,650	4,500	7,910
15	3,932	......	14,840	6,500	4,310	2,048	1,726	726	3,384	4,500	4,120	5,250
7	6,500	......	17,540	5,650	3,746	2,048	1,404	836	1,890	3,746	3,746	5,050
17	5,450	......	17,540	4,680	3,384	2,368	1,726	638	2,048	3,036	3,384	4,860
18	6,500	......	22,440	4,500	3,746	2,048	2,368	638	1,726	2,700	3,036	4,500
19	6,500	......	26,380	4,310	......	2,048	2,206	638	1,404	2,368	3,036	4,120
20	6,500	......	25,810	3,932	3,746	1,890	2,048	500	1,404	2,048	2,868	3,746
21	15,920	......	24,090	......	3,384	1,890	2,048	638	1,562	2,048	3,036	4,500
22	6,500	......	24,650	3,208	2,700	1,562	1,726	638	2,048	2,700	3,746	4,500
23	6,500	......	*a*	3,036	2,700	1,562	1,726	638	1,726	2,368	3,746	4,500
24	6,500	......	29,290	6,720	2,206	1,562	......	638	2,048	1,890	3,384	20,360
25	6,500	......	20,360	15,920	2,048	......	......	500	3,932	1,726	3,036	15,560
26	5,450	4,500	17,540	12,900	2,206	......	......	500	3,384	1,726	3,208	13,500
27	......	......	14,480	31,690	5,050	......	......	500	3,036	1,562	3,208	10,120
28	......	......	22,980	......	5,450	......	......	500	3,036	4,680	3,208	10,720
29	......	......	27,500	13,200	4,860	......	1,252	500	3,036	14,480	3,932	12,584
30	......	......	29,870	10,120	3,560	......	1,100	500	6,060	10,120	4,500	9,556
31	7,650	......	24,650	......	3,036	......	1,100	550	......	6,500	......	10,120
Mean.	11,263	5,500	18,860	8,367	5,097	2,892	1,922	833	2,897	5,497	6,208	7,783

a Discharge above limits of rating curve.

Mean Daily Discharge, Second-feet, of Mohawk River at Fonda, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
1	8,300	3,746	7,650	13,050	17,100	7,910	902	836	525	1,726	1,328	2,285
2	7,170	3,472	7,290	11,040	19,160	6,060	836	726	594	2,048	1,100	2,868
3	5,150	4,405	7,170	8,980	13,500	4,590	770	594	594	1,034	968	2,285
4	4,405	4,500	11,200	7,530	11,040	3,296	836	550	525	902	902	2,285
5	4,590	4,950	10,720	5,750	8,040	2,451	836	500	525	770	902	2,127
6	5,850	5,150	9,980	7,650	6,280	2,048	836	475	594	682	836	2,048
7	5,550	4,950	8,436	10,560	7,290	2,048	968	770	550	770	968	1,808
8	5,250	4,770	8,844	13,350	18,920	1,726	1,100	1,480	638	770	1,100	1,644
9	5,550	4,770	8,170	22,440	14,480	1,808	1,562	1,176	594	682	1,100	*
10	4,950	4,590	7,780	16,700	11,920	2,206	1,726	968	594	726	1,176	
11	4,405	4,405	7,650	14,840	8,572	2,285	1,176	836	638	726	1,480	......
12	3,208	4,310	9,840	13,350	6,280	1,969	1,034	770	525	902	1,726	......
13	......	4,770	17,760	11,344	5,350	1,644	902	836	594	1,176	2,534	......
14	......	4,405	34,400	8,980	7,650	1,562	836	726	550	1,100	2,206	......
15	6,170	11,920	*a*	8,040	8,572	1,328	836	638	682	836	1,808	......
16	5,350	*a*	*a*	12,252	6,170	1,890	770	594	682	902	1,644	......
17	4,860	*a*	29,580	10,120	5,750	2,127	726	594	594	770	1,480	......
18	4,770	*a*	21,380	8,040	5,950	1,808	1,100	5,350	525	770	1,480	......
19	4,310	29,580	17,980	9,840	5,050	1,480	6,830	2,952	525	726	1,480	......
20	3,472	19,640	13,980	10,880	4,405	1,328	6,060	1,808	525	682	1,562	......
21	3,120	17,100	10,880	8,844	3,746	2,784	3,932	1,328	525	638	1,969	......
22	3,296	14,660	9,556	7,410	3,472	2,451	3,296	1,176	525	682	2,127	......
23	5,750	12,584	12,086	6,390	5,150	1,644	3,746	770	525	682	2,285	......
24	5,050	9,980	21,380	7,780	5,250	1,328	2,451	682	525	682	1,969	......
25	4,215	8,980	19,160	10,560	3,384	1,562	2,127	682	500	550	2,368	......
26	3,746	8,170	11,776	11,632	4,215	1,176	2,048	726	525	638	2,285	......
27	2,868	8,040	20,600	12,086	4,950	1,034	1,969	726	525	726	3,036	......
28	3,384	7,780	19,880	12,750	4,500	968	1,644	525	525	1,034	3,839	......
29	3,472	7,910	32,600	12,584	3,472	902	1,328	525	726	1,562	3,036	......
30	3,472	......	25,230	9,124	4,500	902	1,176	525	1,252	1,890	8,040	......
31	3,653	......	17,980	......	6,060	......	1,034	500	......	1,644	......	......
Mean	4,667	8,444	15,205	10,797	7,748	2,210	1,787	1,011	591	949	1,958	2,169

***a* Discharge above limits of rating curve.** *** No record from December 9 to 31, inclusive.**

Mean Daily Discharge, Second-feet, of Mohawk River at Fonda, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1	*	......	19,640	12,418	12,252	2,285	1,252	902	638	1,176	1,176	5,450
2	......	......	15,380	12,900	17,100	1,890	1,176	726	525	1,328	1,100	2,617
3	......	......	12,750	15,020	14,480	1,808	1,100	726	475	1,176	1,100	2,127
4	......	......	11,920	14,480	14,660	1,808	1,100	726	475	1,100	1,100	1,969
5	......	......	9,700	14,840	11,344	2,127	1,100	726	594	1,034	1,100	2,127
6	......	......	8,572	20,120	8,980	4,590	968	726	594	1,034	1,100	1,969
7	......	......	8,170	30,760	10,120	5,950	968	638	770	968	1,100	2,048
8	......	......	7,780	*a*	9,980	3,839	968	594	902	836	1,100	2,534
9	......	......	7,410	29,580	8,980	2,952	770	525	902	726	1,250	2,451
10	......	......	6,610	24,650	8,040	2,617	726	500	968	682	1,170	2,285
11	......	......	11,344	11,488	10,400	4,215	726	450	1,176	726	1,100	1,644
12	......	......	12,252	8,708	14,660	4,405	726	450	1,252	682	1,100	1,644
13	......	......	11,632	10,260	8,844	3,746	682	475	836	638	1,100	1,726
14	......	......	8,572	23,530	7,050	4,500	638	500	550	770	1,100	1,969
15	......	......	7,650	*a*	6,060	4,025	682	450	438	726	1,176	2,048
16	......	......	7,290	*a*	7,410	3,120	726	525	412	682	1,176	2,451
17	......	......	7,170	24,940	8,040	2,285	902	1,890	438	726	1,176	2,368
18	......	......	6,280	20,120	7,410	3,472	836	2,784	550	1,100	1,404	2,048
19	......	......	5,550	17,320	6,060	4,120	902	2,368	525	1,328	1,480	1,969
20	......	......	5,150	18,200	5,350	4,120	770	2,285	500	1,562	1,808	1,890
21	......	......	4,860	16,500	4,500	3,036	836	2,206	475	1,480	1,969	1,890
22	......	......	4,860	13,350	3,653	2,368	836	1,890	500	1,644	2,048	1,726
23	......	......	5,150	12,418	3,384	2,127	968	1,252	525	1,808	2,368	1,726
24	......	36,450	6,390	10,560	3,208	1,890	2,285	726	550	3,296	4,500	1,726
25	......	*a*	12,086	9,840	2,868	1,726	3,120	726	682	3,560	4,500	1,808
26	......	*a*	25,230	8,170	2,617	1,562	2,952	638	726	3,653	2,700	1,969
27	......	34,400	20,860	7,290	2,451	1,480	2,368	682	770	1,969	5,550	2,048
28	......	28,100	28,700	10,120	2,784	1,404	1,808	726	770	1,480	6,170	2,206
29	......	......	20,360	9,268	3,296	1,328	1,404	682	902	1,252	6,280	3,120
30	......	......	16,700	9,700	2,952	1,328	1,034	550	1,100	1,404	6,500	3,560
31	......	......	9,840	......	2,700	......	968	438	......	1,480	......	3,560
Mean	......	32,983	11,157	15,428	7,472	2,871	1,171	951	684	1,356	2,217	2,280

*** No record kept from January 1 to February 23, inclusive.** ***a* Discharge above limits of rating curve.**

Mean Daily Discharge, Second-feet, of Mohawk River at Fonda, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	3,208	6,060	*a*	15,740	4,025	5,150	1,176	1,328	682	7,530	2,868	2,617
2......	2,784	5,850	*a*	13,980	3,746	4,590	1,100	1,328	836	4,310	2,127	2,285
3......	2,206	5,550	*a*	11,344	4,025	4,025	1,034	1,034	902	2,206	1,890	1,890
4......	2,285	4,860	*a*	8,300	5,350	3,839	902	770	1,100	1,644	3,120	1,890
5......	2,368	4,405	29,870	7,410	5,150	4,950	902	1,969	1,328	1,034	4,770	1,890
6......	3,653	5,560	22,170	6,500	5,150	11,776	902	2,868	1,562	726	6,610	1,726
7......	4,310	6,720	29,290	6,610	4,025	13,200	1,034	2,048	2,048	400	5,450	1,890
8......	4,950	6,830	27,500	7,290	3,560	11,632	1,034	1,644	2,285	1,890	4,860	1,969
9......	5,150	6,940	17,100	6,940	3,120	8,170	1,034	1,252	2,868	2,534	6,060	1,969
10......	5,250	6,940	11,488	6,280	2,952	7,650	902	2,048	2,617	1,890	6,500	1,726
11......	5,250	6,830	9,556	4,860	2,700	6,720	968	4,500	1,890	1,562	8,300	1,890
12......	5,250	6,720	8,170	5,250	2,285	7,780	1,034	3,653	1,252	1,480	8,436	1,726
13......	5,050	6,720	7,530	4,860	1,890	6,940	1,100	2,368	1,034	1,404	6,060	2,534
14......	5,050	6,390	7,290	4,680	2,700	5,950	1,100	2,285	1,252	1,252	4,680	3,120
15......	4,950	6,720	6,060	2,868	1,644	4,120	968	1,644	1,100	1,252	4,310	3,296
16......	5,650	6,940	4,860	2,868	1,644	3,208	902	1,176	902	1,100	3,653	3,208
17......	5,250	7,170	4,770	2,868	1,644	3,296	902	1,100	836	1,100	3,746	3,208
18......	4,860	7,170	4,405	2,952	2,127	4,770	968	902	836	836	3,296	3,384
19......	5,850	7,170	4,310	3,746	2,451	5,450	968	836	1,034	836	3,036	3,384
20......	6,830	7,410	9,980	6,830	4,405	3,932	902	902	902	770	2,700	3,120
21......	7,910	8,170	11,488	6,830	5,150	3,296	770	836	836	1,176	3,208	3,036
22......	16,500	8,300	11,200	5,650	6,390	2,868	902	770	836	1,404	3,932	3,208
23......	32,600	9,412	11,632	4,120	5,550	1,404	902	770	902	1,644	2,868	3,208
24......	26,940	10,880	12,418	3,472	4,215	1,969	902	594	836	1,808	2,868	4,310
25......	24,090	10,400	15,740	3,208	6,390	1,644	836	836	1,176	1,890	3,036	4,405
26......	23,530	9,556	20,600	10,120	11,040	1,480	682	836	2,285	1,969	3,932	4,215
27......	21,640	11,920	17,980	10,880	10,720	1,404	968	770	2,868	2,868	3,560	4,120
28......	13,200	*a*	12,584	7,410	8,844	1,644	2,127	770	3,839	3,560	3,384	4,215
29......	9,556	......	12,900	5,750	6,830	1,562	3,296	770	4,680	4,310	3,472	4,310
30......	8,040	......	14,480	5,450	6,390	1,252	2,127	682	5,550	3,653	3,560	4,770
31......	6,720	......	15,560	......	6,060	......	1,480	682	......	3,384	......	4,680
Mean...	9,061	7,318	13,368	6,502	4,586	4,856	1,123	1,418	1,702	2,046	4,210	3,006

a Discharge above limits of rating curve.

Monthly Discharge of Mohawk River at Fonda, N. Y.
[Drainage area, 2,156 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1906.					
May	13,200	3,932	7,556	3.50	4.04
June	5,450	1,726	2,771	1.29	1.44
July	6,280	1,252	2,781	1.29	1.49
August	3,036	726	1,531	0.710	0.819
September	1,726	500	948	0.440	0.491
October	5,650	1,100	2,392	1.11	1.28
November	11,920	1,562	3,971	1.80	2.01
December	13,820	3,036	6,349	2.94	3.39
1907.					
January	*a*30,450	3,932	11,263	5.22	6.02
February	....	....	....	....	....
March	*a*29,870	3,932	18,860	8.75	10.09
April	31,690	3,036	8,367	3.88	4.33
May	11,344	2,048	5,097	2.36	2.72
June	7,170	1,562	2,892	1.34	1.50
July	4,500	1,100	1,922	0.891	1.03
August	2,048	500	833	0.386	0.445
September	10,120	500	2,897	1.34	1.50
October	15,560	1,562	5,497	2.55	2.94
November	*a*27,500	2,868	6,208	2.88	3.21
December	25,810	2,368	7,783	3.61	4.16

a Highest recorded discharge; maximum exceeds limits of rating curve.

Monthly Discharge of Mohawk River at Fonda, N. Y.—(Continued).
[Drainage area, 2,156 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1908.					
January	8,300	2,868	4,667	2.16	2.49
February	*a*29,580	3,472	8,444	3.92	4.23
March	*a*34,400	7,170	15,205	7.05	8.13
April	22,440	6,390	10,797	5.01	5.59
May	19,160	3,384	7,748	3.58	4.13
June	7,910	902	2,210	1.03	1.15
July	6,830	726	1,787	0.829	0.956
August	5,350	500	1,011	0.469	0.541
September	1,252	500	591	0.274	3.06
October	2,048	550	949	0.440	0.507
November	8,040	836	1,958	0.908	1.01
1909.					
March	28,700	4,860	11,157	5.17	5.96
April	*a*30,760	7,290	15,428	7.16	7.99
May	17,100	2,451	7,472	3.47	4.00
June	5,950	1,328	2,871	1.33	1.48
July	3,120	638	1,171	0.543	0.626
August	2,784	438	951	0.441	0.508
September	1,252	412	684	0.317	3.54
October	3,653	638	1,356	0.629	0.725
November	6,500	1,100	2,217	1.03	1.15
December	5,450	1,644	2,280	1.06	1.22
1910.					
January	32,600	2,206	9,061	4.20	4.84
February	*a*11,920	4,405	7,318	3.39	3.53
March	*a*29,870	4,310	13,368	6.20	7.15
April	15,740	2,868	6,502	3.02	3.37
May	11,040	1,644	4,586	2.13	2.46
June	13,200	1,252	4,856	2.25	2.51
July	3,296	682	1,123	0.521	0.601
August	4,500	594	1,418	0.658	0.759
September	5,550	682	1,702	0.789	0.880
October	7,530	400	2,046	0.949	1.09
November	6,610	1,890	4,210	1.95	2.18
December	4,770	1,726	3,006	1.39	1.60

a Highest recorded discharge; maximum exceeds limits of rating curve.

MOHAWK RIVER AT FORT PLAIN, N. Y.

A gage was established on the highway bridge crossing the Mohawk river at Fort Plain, December 30, 1905, by C. A. Poole, for this Department. A box-and-chain gage is attached to the bridge guard-rail on the down-stream side, 50 feet from the right-hand abutment. The elevation of water-surface, when the gage reads zero, is 290.47. The standard chain length is 29.30. The bridge is subdivided to five-foot sections for current-meter measurements. The initial point is the face of the left-hand abutment on the down-stream side of the bridge.

The results are not at present available for publication.

MOHAWK RIVER AT LITTLE FALLS, N. Y.

A gaging station was established at the lower (Gilbert's) dam at Little Falls, N. Y., for the United States Board of Engineers on Deep Waterways in 1898. It was maintained by the U. S. Geological Survey in coöperation with this Department from 1900 to June, 1907, inclusive, when it was taken over by this Department. The dam is of masonry, having the form of a circular arc, and furnishes power for the Astoronga Knitting Mill and the mill of the Little Falls Paper Company. Records of the crest gage and run of the water-wheels at the Astoronga mill were taken by John Schmelze during 1910. At the paper mill a record has been kept, beginning June 1, 1907, by C. T. Barrett.

There are three dams at Little Falls. The upper one is a State dam, diverting water for the supply of the Erie canal; the lower two are used for water-power development. The gage record kept at the lower dam shows the amount of water flowing down-stream from Little Falls, but does not include the diversion at the State dam above the gaging station, and hence does not represent the total yield from the tributary drainage area of about 1,306 square miles.

Mean Daily Discharge, Second-feet, of Mohawk River at Little Falls, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	585	1,492	23,444	8,663	*2,185	3,256	1,085	1,065	943	2,302	1,346	1,955
2......	*793	1,800	24,299	7,197	2,238	2,811	917	946	1,115	*1,556	879	1,706
3......	1,145	1,707	18,980	*5,551	2,794	2,475	*754	819	1,100	1,704	1,293	1,689
4......	1,111	1,405	14,163	4,768	5,575	2,094	715	868	*1,139	1,225	2,455	*1,634
5......	1,076	1,469	12,642	4,765	5,023	*1,718	935	3,319	1,502	1,190	2,532	1,433
6......	1,111	*1,364	*9,903	4,117	3,368	5,902	803	2,495	2,475	1,313	*2,759	1,262
7......	1,216	1,363	13,300	5,020	2,682	7,506	682	*2,002	2,825	2,038	4,289	1,212
8......	1,284	1,456	12,023	4,191	*2,175	6,631	1,064	1,806	1,980	2,487	2,615	1,172
9......	*1,254	1,595	9,250	3,942	2,332	4,924	987	1,334	1,410	*1,780	2,539	1,123
10......	1,382	1,636	6,720	*3,072	2,124	3,386	*676	1,108	1,092	1,847	4,939	1,012
11......	1,265	1,495	5,398	2,924	1,873	3,797	1,133	2,991	*833	1,388	6,796	*853
12......	1,150	1,332	4,283	3,389	1,761	*4,079	1,204	3,600	1,021	1,305	5,882	1,009
13......	1,145	*1,110	*4,159	2,767	1,632	4,193	1,003	2,082	956	1,305	*4,163	1,186
14......	1,180	1,405	4,919	2,327	1,599	2,941	819	*2,041	956	1,251	2,150	1,152
15......	1,045	1,495	3,962	1,718	*1,359	2,476	819	1,257	1,064	1,065	3,164	1,186
16......	*873	1,596	3,300	1,771	1,312	2,256	834	1,025	918	*969	2,789	1,117
17......	1,038	1,583	3,100	*2,090	1,119	2,091	*874	907	815	1,087	2,579	1,023
18......	1,084	1,667	2,528	2,154	1,153	3,377	907	819	*647	1,054	2,101	*878
19......	2,010	1,701	2,645	4,419	2,514	*3,978	868	1,300	661	1,064	1,884	1,103
20......	2,075	*1,652	*4,998	5,028	2,883	3,160	714	1,442	703	1,213	*1,585	1,261
21......	3,491	1,830	6,078	4,199	3,550	2,27[illegible]	783	*873	58[illegible]	1,089	1,925	1,190
22......	6,892	2,629	6,680	3,329	*4,474	1,864	783	1,253	645	1,093	1,051	1,121
23......	*8,276	2,573	6,918	2,458	2,037	1,620	873	999	623	*977	1,060	1,225
24......	7,526	2,380	7,057	*2,228	2,521	1,471	*916	791	803	1,702	2,386	929
25......	6,927	2,292	8,668	2,076	5,107	1,163	1,065	844	*458	1,467	2,668	*1,457
26......	5,382	2,102	9,743	2,575	7,063	*902	985	939	2,930	1,748	2,913	1,534
27......	3,941	*2,195	*8,427	5,426	5,645	1,114	946	884	2,708	2,205	*2,341	1,377
28......	3,290	11,769	7,243	4,331	3,998	1,168	1,108	*754	6,795	3,349	2,184	1,516
29......	2,500	......	7,258	3,115	*2,611	1,120	2,490	955	6,470	3,317	1,076	1,373
30......	*1,853	......	8,042	2,688	2,794	1,050	1,431	910	3,484	*2,476	1,739	1,484
31......	2,068	......	8,123	......	4,204	......	*1,243	895	......	1,995	......	2,334
Mean	2,480	2,075	8,653	3,743	2,990	2,893	981	1,398	1,655	1,631	2,603	1,307

* Sunday.

Monthly Discharge of Mohawk River at Little Falls, N. Y.
[Drainage area, 1,329 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
January	8,276	585	2,480	1.87	2.15
February	11,769	1,110	2,075	1.56	1.62
March	24,299	2,528	8,653	6.51	7.49
April	8,663	1,718	3,743	2.82	3.16
May	7,063	1,119	2,990	2.25	2.59
June	7,506	902	2,893	2.18	2.44
July	2,490	676	981	0.738	0.849
August	3,600	754	1,398	1.05	1.21
September	6,795	458	1,655	1.25	1.40
October	3,349	969	1,631	1.23	1.41
November	6,796	879	2,603	1.96	2.20
December	2,334	853	1,307	0.983	1.13

Current-meter Discharge Measurements of Erie Canal Feeder at Little Falls, N. Y.

DATE.	Hydrographer.	REFERENCE POINT READING.			Meter No.	Lateral interval.	Submergence depth.	Area flowing.	Total width.	Computed discharge.
		Beginning.	Ending.	Mean.						
						Feet.		*Square feet.*	*Feet.*	*Second-feet.*
1910. July 29	A. T. Clark	2.7	2.7	2.7	559	2	0.6	77	20.5	116

MOHAWK RIVER NEAR HERKIMER, N. Y.

This gaging station, which is located at the highway bridge over the Mohawk river between Herkimer and Mohawk, was established November 23, 1904, by C. A. Poole for this Department. The gage is a vertical board secured to the left-hand, or north abutment of the bridge. The gage is in two sections reading from zero to 3.4 feet and from 3.4 to 15.0 feet, respectively. It is graduated in feet and tenths and the elevation of zero is 377.43. Observations of the stage of the stream were taken twice each day by Henry Edick, Jr., from January 1 to August 31, 1910, when the record was temporarily suspended.

Preceding the fall of 1908 current-meter measurements were made from the down-stream side of the bridge. Later measurements have been made from the up-stream side of bridge, which has a single span of 124.3 feet. The river channel is of uniform cross-section and straight for several hundred feet below the bridge. About 200 feet above the bridge there is a slight bend to the south. During extreme high water the river overflows its banks and flows through additional openings in the dike formed by the highway, and it is necessary to measure this additional flow in order to get the total flood discharge at this station.

This gaging station is located about one and one-quarter miles above the junction of the Mohawk river and West Canada creek. The drainage area of West Canada creek, above its junction with the Mohawk river, is 583 square miles and the drainage area of the Mohawk, above the same point, is about 712 square miles.

The stream channel is obstructed by aquatic grass during the summer months, so that there is not a constant relation between gage height and discharge. The channel is also obstructed by ice in winter and the record is approximate only.

Current-meter Discharge Measurements of Mohawk River near Herkimer, N. Y.

DATE.	Hydrographer.	GAGE READING.			Meter No.	Lateral interval.	Submergence depth.	Area flowing.	Total width.	Computed discharge.	Velocity correction factor.	Corrected discharge.
		Beginning.	Ending.	Mean.								
						Feet.		*Square feet.*	*Feet.*	*Second-feet.*		*Second-feet.*
1910.												
May 4...	Clark & Button...	3.98	4.00	3.99	559	5	0.6	914	125	2,960	0.957	2,833
June 15..	H. V. Button.....	1.75	1.70	1.72	559	5	0.6	606	125	996	0.957	953
Aug. 9...	Barrett & Patchke.	2.0	2.0	2.0	462	5	0.6	647	125	245	0.957	235
Aug. 15..	Clark & Button...	1.95	1.95	1.95	462	5	0.6	659	125	250	0.957	239
Sept. 21..	A. T. Clark	1.3	1.3	1.3	559	5	0.6	551	125	219	0.957	210

Mean Daily Discharge, Second-feet, of Mohawk River near Herkimer, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1.....	5,020	1,200	437	3,425	2,620	590	698	460	*255	1,508	1,263	*1,230
2.....	8,630	1,040	495	1,607	2,350	*526	804	547	264	664	1,100	1,170
3.....	8,290	*1,070	*620	1,230	1,465	464	750	526	321	568	*2,260	1,040
4.....	......	1,040	750	1,170	1,940	942	471	*389	493	2,032	3,510	850
5.....	......	942	910	1,135	*2,395	556	375	330	639	3,006	3,090	780
6.....	*7,310	780	850	1,135	1,607	1,360	360	340	450	*1,864	1,752	720
7.....	5,500	720	750	*1,007	1,465	2,750	*342	312	369	1,497	5,455	650
8.....	4,600	650	685	974	1,430	1,784	325	292	*340	3,425	5,500	*558
9.....	3,890	558	620	1,100	1,296	*1,135	342	292	330	3,798	6,540	750
10.....	3,510	*526	*526	1,135	1,395	910	360	273	321	3,654	*4,980	4,265
11.....	1,682	464	558	1,296	1,395	780	390	*255	786	2,511	3,210	4,390
12.....	1,135	410	590	1,644	*1,360	720	550	255	1,230	1,797	2,010	4,310
13.....	*750	464	780	1,682	1,360	620	648	255	837	*1,481	1,570	4,000
14.....	974	350	2,485	*1,860	974	590	*535	460	450	876	1,500	2 010
15.....	1,070	380	4,520	1,607	815	558	471	255	*340	715	1,360	*1,135
16.....	780	410	4,855	1,070	815	*650	390	255	312	600	1,230	1,500
17.....	558	*410	*4,855	1,007	974	590	535	292	283	568	*1,135	1,360
18.....	526	350	5,130	1,135	880	558	698	*283	283	520	1,100	1,170
19.....	526	410	4,770	1,040	*974	526	648	255	273	471	1,100	1,100
20.....	*2,835	350	5,130	910	910	526	568	255	244	*425	1,070	1,007
21.....	2,710	325	4,770	*850	750	464	*715	292	321	550	1,200	974
22.....	2,170	526	4,770	780	620	437	550	273	*408	535	1,430	*974
23.....	1,975	250	5,020	685	495	*325	550	264	330	471	1,230	1,860
24.....	1,752	*223	*5,780	3,380	464	275	535	264	398	455	*1,135	4,435
25.....	1,644	173	6,740	3,550	410	250	950	*273	440	390	1,328	5,095
26.....	1,570	150	5,830	4,180	*1,007	410	1,130	255	429	390	1,230	5,680
27.....	*1,465	196	4,940	4,600	2,090	750	876	264	398	*360	1,770	4,220
28.....	1,535	250	5,060	*4,435	1,900	685	*632	292	360	1,999	1,263	3,848
29.....	1,465	......	5,590	3,595	1,263	620	568	283	*379	3,463	1,975	*3,763
30.....	1,360	......	6,350	1,975	974	*974	568	273	705	3,276	1,822	3,550
31.....	1,296	......	*5,180	......	590	......	568	255	......	876	......	3,210
Mean..	2,639	522	3,237	1,840	1,258	744	577	309	433	1,443	2,171	2,312

* Sunday.

Mean Daily Discharge, Second-feet, of Mohawk River near Herkimer, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
1	3,255	1,040	*1,784	4,180	3,340	2,750	310	292	292	504	*815	815
2	2,090	*1,230	1,860	3,550	3,720	1,784	325	*292	312	487	720	880
3	1,430	1,100	2,920	3,340	*3,510	1,070	310	283	312	504	685	815
4	1,135	1,100	3,380	3,170	3,005	780	310	264	302	*440	620	620
5	*974	1,040	3,210	*1,900	2,620	590	*342	264	283	408	685	526
6	942	1,040	2,665	2,790	1,395	495	425	340	*273	390	880	*495
7	1,135	1,040	2,440	3,680	1,822	*410	408	360	312	390	815	815
8	1,100	1,007	*2,530	3,763	3,763	410	455	379	321	360	*750	1,200
9	1,230	*974	2,395	4,730	3,890	380	648	*340	292	360	815	1,500
10	1,135	880	2,000	4,810	*3,425	780	487	312	312	360	880	1,430
11	1,040	910	1,860	4,900	2,215	685	440	312	292	*455	942	1,784
12	*1,230	880	3,255	*3,935	1,644	558	*455	292	292	535	1,430	815
13	2,350	850	4,600	2,790	1,328	495	471	312	*283	504	1,360	*720
14	2,575	1,135	6,230	2,090	1,500	*464	504	369	274	455	1,100	910
15	1,607	5,830	*7,020	2,350	2,050	437	520	340	273	425	*1,007	1,296
16	1,296	*.....	7,170	3,340	1,500	850	504	*321	274	390	910	1,465
17	1,200	9,230	5,635	2,790	*1,570	750	504	330	273	390	815	1,465
18	1,040	6,805	4,390	1,822	1,900	650	841	526	274	*375	880	1,395
19	*815	5,780	4,265	*2,620	1,200	620	*1,775	418	264	342	1,007	1,328
20	910	5,545	3,050	2,960	850	720	1,690	379	*255	325	1,263	*1,200
21	780	5,410	2,530	2,350	685	*1,570	930	340	255	295	1,570	1,070
22	1,200	4,810	*2,010	1,822	815	850	988	312	255	263	*1,296	815
23	1,570	*4,100	2,960	1,644	1,296	590	1,130	*292	255	263	1,230	558
24	1,230	3,170	4,140	1,465	*1,070	720	715	283	273	232	1,170	526
25	1,007	2,750	4,180	1,430	720	780	568	292	274	*232	1,135	495
26	*720	2,350	4,255	*1,430	650	685	*648	273	273	295	1,070	526
27	974	2,395	4,940	1,430	1,328	620	615	273	*264	440	1,007	*526
28	815	2,260	5,060	1,570	1,170	*590	550	292	255	520	942	526
29	750	2,050	*6,540	1,860	720	590	487	273	429	600	*880	464
30	720	......	6,670	1,395	850	620	487	*273	408	568	815	410
31	685	......	5,310	......	*1,360	......	471	292	......	504	......	558
Mean	1,256	2,740	3,914	2,730	1,836	776	623	320	290	407	983	902

*** Sunday.**

Mean Daily Discharge, Second-feet, of Mohawk River near Herkimer, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1	590	1,395	4,685	4,560	3,806	495	295	225	244	408	780	1,135
2	526	1,328	3,300	4,480	4,435	437	295	234	255	487	750	942
3	464	1,328	2,750	5,230	5,095	410	325	216	255	487	720	910
4	620	1,570	2,575	5,360	4,730	350	408	225	244	455	780	750
5	1,570	2,440	1,784	5,270	3,170	1,100	342	244	264	425	720	780
6	4,265	5,360	1,607	5,880	1,822	2,790	390	234	302	425	650	750
7	4,435	5,500	1,395	6,870	1,940	2,170	342	214	302	455	650	750
8	5,270	5,410	1,170	7,470	1,940	1,100	295	264	283	425	685	850
9	5,410	4,855	1,200	6,045	1,720	750	310	255	264	390	685	780
10	4,180	4,180	1,360	5,500	2,090	720	279	264	244	390	620	685
11	3,595	3,380	3,130	4,310	3,130	1,328	375	234	283	360	590	590
12	3,090	3,170	3,680	3,255	3,640	1,230	425	234	264	325	558	620
13	2,665	3,050	2,260	3,605	2,215	880	325	216	234	325	526	685
14	2,350	2,485	1,682	4,600	1,430	942	360	225	234	360	526	750
15	2,215	2,305	1,535	6,415	1,230	880	342	206	216	342	558	780
16	2,050	2,575	1,500	6,740	2,050	750	375	216	255	325	650	815
17	1,900	2,790	1,465	5,410	2,530	720	390	283	302	360	910	815
18	1,822	2,790	1,170	4,180	2,215	1,040	375	340	283	390	1,263	815
19	1,570	3,090	1,070	3,595	1,682	1,170	390	408	264	425	1,200	780
20	1,752	6,600	974	3,170	1,296	850	471	340	244	455	1,135	750
21	1,900	7,310	880	2,790	1,070	650	440	312	234	487	1,070	780
22	2,090	7,390	850	2,440	910	558	375	255	225	504	1,135	750
23	3,806	6,600	910	2,440	685	526	520	244	225	471	1,040	750
24	6,805	6,230	1,644	1,752	620	526	785	225	283	732	1,040	780
25	8,040	7,620	3,640	1,395	558	558	600	234	321	608	1,040	720
26	8,040	6,945	4,980	1,296	495	526	550	234	283	568	942	780
27	6,100	6,805	5,680	1,230	526	558	520	234	264	487	880	750
28	5,455	5,880	5,095	1,328	880	558	504	234	283	390	850	750
29	3,425	......	4,480	1,535	815	590	408	234	264	408	1,230	720
30	2,050	......	4,100	1,940	685	620	408	234	244	408	1,500	650
31	1,822	......	3,890	......	558	......	390	234	......	408	......	720
Mean	3,222	4,299	2,466	4,013	1,934	859	407	251	263	438	856	770

Mean Daily Discharge, Second-feet, of Mohawk River near Herkimer, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.*a*	Oct.*a*	Nov.*a*	Dec.*a*
1910.												
1.....	350	720	......	2,170	526	1,607	163	255	......	......	......	......
2.....	437	495	......	1,784	720	1,070	263	244	......	......	......	......
3.....	464	526	9.080	1,395	1,007	910	425	255	......	......	......	......
4.....	410	495	7,710	1,170	2,485	780	360	264	......	......	......	......
5.....	437	437	6,805	1,040	1,940	850	390	302	......	......	......	......
6.....	464	350	6,165	910	1,100	2,790	455	255	......	......	......	......
7.....	410	350	7,240	1,135	780	3,130	440	273	......	......	......	......
8.....	437	380	7,390	1,007	720	3,640	425	255	......	......	......	......
9.....	437	410	6,415	910	650	2,835	390	273	......	......	......	......
10.....	419	380	5,180	850	558	2,090	360	312	......	......	......	......
11.....	464	350	3,380	815	558	2,790	390	360	......	......	......	......
12.....	464	325	2,440	815	526	3,210	425	471	......	......	......	......
13.....	410	325	2,485	974	815	3,050	375	535	......	......	......	......
14.....	350	350	2,710	880	495	2,530	360	482	......	......	......	......
15.....	410	410	2,440	815	495	2,710	205	360	......	......	......	......
16.....	380	410	1,822	720	495	2,350	408	369	......	......	......	......
17.....	325	350	1,500	650	526	2,130	455	340	......	......	......	......
18.....	250	380	1,328	650	558	2,880	375	398	......	......	......	......
19.....	942	410	1,465	974	1,170	2,575	487	450	......	......	......	......
20.....	1,860	437	2,750	1,200	1,360	1,940	750	408	......	......	......	......
21.....	1,975	526	3 806	974	1,940	1,230	615	360	......	......	......	......
22.....	5,180	1,100	3,890	720	2,170	1,170	600	400	......	......	......	......
23.....	4,810	1,296	4,180	650	974	974	568	526	......	......	......	......
24.....	4,940	1,200	4,600	620	974	685	615	535	......	......	......	......
25.....	5,095	1,100	4,265	720	2,170	526	680	471	......	......	......	......
26.....	4,140	1,040	4,435	1,822	3,470	526	585	429	......	......	......	......
27.....	2,215	1,296	4,140	1,263	2,790	464	487	389	......	......	......	......
28.....	1,822	8,205	3,980	942	1,430	526	425	369	......	......	......	......
29.....	2,010	......	3,550	780	1,170	526	440	389	......	......	......	......
30.....	1,682	......	2,710	720	1,465	410	425	351	......	......	......	......
31.....	1,007	......	2,395	......	2,050	......	390	369	......	......	......	......
Mean...	1,451	860	4,147	1,002	1 229	1,764	446	371	......	......	......	......

a No record.

Monthly Discharge of Mohawk River near Herkimer, N. Y.
[Drainage area, 707 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1907.					
January	8,630	526	2,639	3.73	4.29
February	1,200	150	522	0.74	0.77
March	6,740	437	3,237	4.58	5.27
April	4,600	685	1,840	2.60	2.91
May	2,620	410	1,258	1.78	2.05
June	2,750	250	744	1.05	1.18
July	1,130	325	577	0.82	0.94
August	547	255	309	0.44	0.51
September	1,230	244	433	0.61	0.68
October	3,798	360	1,443	2.04	2.35
November	6.540	1,070	2,171	3.07	3 44
December	5,680	558	2,312	3.27	3.76
1908.					
January	3,255	685	1,256	1.777	2.004
February	9,230	850	2,740	3.876	4.186
March	7,170	1,784	3,914	5.536	6.366
April	4,900	1,395	2,730	3.861	4.324
May	3,890	650	1,836	2.597	2.987
June	2,750	380	776	1.098	1.230
July	1,775	310	623	0.881	1.013
August	526	264	320	0.453	0.521
September	429	255	290	0.410	0.459
October	600	232	407	0.576	0.662
November	1,570	620	983	1.399	1.557
December	1,784	410	902	1.276	1.456

Monthly Discharge of Mohawk River near Herkimer, N. Y.—(Continued).
[Drainage area, 707 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1909.					
January	8,040	464	3,222	4.56	5.24
February	7,620	1,328	4,299	6.08	6.32
March	5,680	850	2,466	3.49	4.01
April	7,470	1,230	4,013	5.68	6.36
May	5,095	495	1,934	2.74	3.15
June	2,790	350	859	1.22	1.37
July	785	279	407	0.576	0.662
August	408	206	251	0.355	0.408
September	321	216	263	0.372	0.417
October	732	325	438	0.620	0.713
November	1,500	526	856	1.21	1.36
December	1,135	590	770	1.09	1.25
1910.					
January	5,180	250	1,451	2.052	2.360
February	8,205	325	860	1.216	1.265
March	9,080	1,328	4,147	5.866	6.746
April	2,170	620	1,002	1.417	1.587
May	3,470	495	1,229	1.738	1.999
June	3,640	410	1,764	2.495	2.794
July	750	163	446	0.631	0.726
August	535	244	371	0.525	0.604

MOHAWK RIVER AT FLOYD AVENUE, ROME, N. Y.

A box-and-chain gage was erected by E. F. Weeks, of this Department, at Riverside bridge crossing Mohawk river near Rome, July 9, 1907. The gage is attached to the up-stream hand-rail near the left-hand end of the bridge. The gage reads from zero to 7.5 feet. The standard chain length is 18.98 feet and the elevation of water-surface, when the gage reads zero, is 445.16. Readings are taken each morning and afternoon by G. G. Williams. A bench-mark located at the junction of the up-stream wing wall and left-hand abutment is at elevation 460.80. The channel is straight for some distance up-stream and down-stream from the bridge. Current-meter measurements are made on the down-stream side, the initial point being the face of the right-hand abutment. A crude dam or barrier of boulders has been placed across the stream a few hundred feet down-stream for the purpose of raising the water-level to produce an ice pond.

Owing to ice obstruction, it is believed that the record for winter months may be excessive, but the record is otherwise good.

Current-meter Discharge Measurements of Mohawk River at Floyd Ave., Rome, N. Y.

DATE.	Hydrographer.	Gage Reading.			Meter No.	Lateral interval.	Submergence depth.	Area flowing.	Total width.	Computed discharge.	Velocity correction factor.	Corrected discharge.
		Beginning.	Ending.	Mean.								
1910.						Feet.		Square feet.	Feet.	Second-feet.		**Second-feet.**
Feb. 28	Patchke & Robbins	6.55	6.53	6.54	213	5	1 Ft.	891	106.5	5,458	1.00	**5,458**
Feb. 28	Patchke & Robbins	6.53	6.55	6.54	213	5	1 Ft.	891	106.5	5,361	1.00	**5,361**
Mar. 1	Patchke & Robbins	5.53	5.50	5.52	213	5	1 Ft.	782	106.5	4,107	1.00	**4,107**
Mar. 2	Patchke & Robbins	5.21	5.17	5.19	213	5	1 Ft.	748	106.5	3,596	1.00	**3,596**
Mar. 2	Patchke & Robbins	5.17	5.13	5.15	213	5	1 Ft.	743	106.5	3,465	1.00	**3,465**
Mar. 4	Patchke & Robbins	3.36	3.30	3.33	213	5	1 Ft.	517	106.5	1,603	1.00	**1,603**
June 14	H. V. Button	1.80	1.85	1.82	559	5	0.6	337	105.0	313	1.12	**351**
July 13	Todd & Patchke	1.65	1.65	1.65	559	5	0.6	377	105.0	261	1.12	**293**
Aug. 13	Barrett & Patchke	2.23	2.21	2.22	462	5	0.6	432	105.0	432	1.12	**350**
Aug. 18	Clark & Button	1.50	1.50	1.50	462	5	0.6	344	95.0	167	1.12	**187**
Aug. 29	A. R. Patchke	1.50	1.50	1.50	559	5	0.6	366	95.0	209	1.12	**233**

Mean Daily Discharge, Second-feet, of Mohawk River at Floyd Avenue, Rome, N. Y.

DAY.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.						
1	......	......	135	192	355	416
2	......	......	158	295	355	295
3	......	......	158	355	1,902	242
4	......	......	242	295	1,385	135
5	......	......	355	295	550	135
6	......	......	295	481	550	158
7	......	......	242	715	3,915	158
8	......	......	192	2,962	1,585	192
9	......	......	192	715	812	192
10	192	......	295	481	715	5,740
11	192	......	416	630	630	2,592
12	242	158	481	715	481	715
13	242	135	295	481	416	416
14	192	115	242	416	416	355
15	158	135	158	355	355	355
16	158	135	158	295	355	416
17	192	158	192	295	355	355
18	355	158	192	295	355	355
19	242	158	192	242	416	295
20	192	158	242	242	355	242
21	158	158	355	295	630	242
22	158	158	550	295	416	295
23	242	158	550	295	355	1,585
24	355	158	550	242	295	3,362
25	902	158	715	242	295	1,189
26	481	135	812	242	355	715
27	295	158	550	355	355	550
28	192	158	481	4,055	355	1,796
29	158	106	242	2,474	416	1,094
30	242	135	192	902	355	2,359
31	192	158	......	550	......	1,688
Mean	260	148	320	668	670	924

Mean Daily Discharge, Second-feet, of Mohawk River at Floyd Avenue, Rome, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
1......	498	83	230	1,285	2,620	610	230	230	180	205	242	416
2......	340	83	400	1,660	995	310	230	205	180	180	192	355
3......	255	83	740	925	1,285	280	242	180	192	180	205	280
4......	180	83	498	610	740	280	230	230	192	180	230	355
5......	150	83	465	481	498	280	230	205	180	180	230	355
6......	165	83	400	1,930	416	280	205	280	180	180	230	370
7......	205	83	370	1,930	1,212	295	230	242	230	165	230	715
8......	230	83	295	2,680	2,359	280	610	242	192	165	255	1,360
9......	205	83	310	2,832	995	630	280	192	165	180	340	880
10......	165	83	340	1,360	690	370	255	230	180	180	340	880
11......	110	83	370	1,770	498	295	230	180	205	340	530	880
12......	140	83	465	1,070	400	280	192	192	230	255	550	995
13......	530	89	610	1,070	355	230	192	280	180	280	340	970
14......	255	105	1,260	812	610	230	205	255	180	180	310	902
15......	130	2,502	2,359	1,070	570	370	205	280	180	205	280	1,118
16......	120	3,880	2,865	1,094	432	400	192	205	180	180	295	1,260
17......	108	2,330	1,410	690	630	280	255	180	180	180	340	835
18......	110	1,585	1,020	650	465	280	2,680	400	192	205	295	835
19......	108	1,020	740	1,070	340	242	1,460	280	192	180	295	465
20......	105	880	530	790	255	1,930	530	230	192	230	570	465
21......	91	690	400	570	280	432	400	205	180	192	416	355
22......	100	610	498	498	280	340	1,260	230	180	180	340	340
23......	109	465	790	530	280	340	465	205	180	180	570	355
24......	90	400	1,410	530	230	310	340	192	158	180	880	355
25......	90	340	1,822	530	230	370	550	180	165	242	1,212	400
26......	92	340	3,730	570	400	295	465	180	180	340	812	610
27......	94	295	3,330	465	432	280	310	180	205	370	570	715
28......	91	280	4,235	630	310	255	280	180	165	310	432	416
29......	90	280	3,460	498	280	230	280	158	432	481	355	400
30......	90	......	1,985	465	280	280	230	165	205	280	340	416
31......	90	......	1,385	......	690	......	230	180	......	230	......	530
Mean...	166	589	1,249	1,036	647	376	442	218	194	226	408	632

Mean Daily Discharge, Second-feet, of Mohawk River at Floyd Avenue, Rome, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1......	670	280	514	1,435	2,930	268	255	*218	158	242	255	255
2......	550	268	449	1,165	*1,385	242	255	192	172	242	255	280
3......	*590	268	570	1,822	1,070	295	280	192	165	*268	205	218
4......	465	268	530	*2,210	1,045	340	*205	192	192	255	205	192
5......	1,141	370	481	2,680	650	1,118	218	165	*242	255	218	*172
6......	3,558	1,770	481	3,985	570	*880	192	172	205	242	205	172
7......	1,360	*2,590	*449	5,898	690	449	205	165	192	218	*230	180
8......	948	1,236	400	3,265	570	385	230	*158	180	218	268	514
9......	1,141	1,141	481	2,650	*465	400	205	158	180	192	416	630
10......	*835	1,460	550	1,020	1,385	514	205	158	192	*205	325	192
11......	530	550	449	*970	1,742	570	*192	158	172	205	242	242
12......	449	1,070	432	1,045	740	416	192	165	*165	230	230	*481
13......	355	465	432	3,060	514	*370	192	158	165	192	205	590
14......	481	*498	*355	5,108	465	340	205	145	158	192	*192	570
15......	514	1,094	385	1,958	400	310	242	*158	158	172	192	514
16......	590	1,212	340	1,260	*765	370	265	449	180	218	205	530
17......	*630	880	310	1,435	570	310	218	242	135	*295	449	481
18......	670	514	255	*1,410	514	498	*242	218	158	295	530	416
19......	690	340	268	1,335	449	416	268	205	*180	242	449	*432
20......	690	5,070	268	1,165	370	*385	242	205	180	295	416	432
21......	812	*3,492	*355	765	325	325	205	192	158	325	*416	465
22......	880	948	280	1,510	325	325	205	*158	158	325	610	416
23......	1,360	570	340	1,310	*242	295	416	158	158	449	1,045	432
24......	*4,345	2,590	385	590	268	295	449	150	192	*481	550	416
25......	2,416	2,155	2,330	*498	230	255	*355	125	172	400	416	416
26......	1,660	1,094	1,875	550	205	268	268	165	*158	370	1,094	*432
27......	812	670	1,742	498	230	*242	230	172	158	280	280	416
28......	630	*514	*812	995	280	218	242	165	158	242	*230	400
29......	432	......	812	514	280	218	218	*180	158	242	690	370
30......	481	......	670	1,610	*192	255	242	172	172	205	400	340
31......	*385	......	902	......	242	......	205	158	......	*242	......	416
Mean...	1,002	1,192	610	1,791	649	386	243	183	172	266	381	387

* Sunday.

Mean Daily Discharge, Second-feet, of Mohawk River at Floyd Avenue, Rome, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	340	230	4,530	1,070	*192	340	192	230	230	280	280	280
2	*416	280	3,625	610	400	355	230	192	230	*230	310	205
3	650	370	2,388	*465	570	340	*205	205	370	205	570	230
4	715	970	1,715	400	715	340	180	180	*432	230	370	*230
5	715	880	1,410	400	280	*340	205	310	355	205	715	150
6	690	*650	*2,128	355	255	1,485	180	355	432	192	*835	165
7	650	432	3,950	370	230	2,270	192	*280	370	189	550	180
8	715	465	1,688	340	*192	790	242	230	268	400	465	205
9	*610	610	1,094	310	230	570	230	230	230	*280	400	180
10	570	650	812	*280	370	530	*205	370	230	280	650	400
11	465	570	610	280	255	690	255	1,070	*180	255	1,822	*355
12	530	690	610	355	192	*610	205	355	205	230	690	295
13	465	*740	*630	295	180	465	192	242	218	242	*570	242
14	498	630	1,070	242	180	370	192	*205	230	230	550	242
15	481	570	550	230	*158	310	192	205	180	192	465	230
16	*530	498	465	230	150	280	230	180	165	*230	465	230
17	570	530	340	*192	150	295	*205	180	180	230	400	230
18	465	498	355	230	530	1,485	192	180	*180	205	310	*230
19	432	610	530	570	812	*610	180	242	180	205	280	255
20	835	*570	*1,360	355	400	400	180	205	158	180	*230	255
21	2,330	650	1,560	295	1,875	355	180	*180	158	205	205	230
22	3,805	1,165	1,285	255	*740	310	242	158	180	355	230	230
23	*1,985	1,070	1,610	242	465	280	230	150	158	*370	280	230
24	1,070	970	2,042	*192	400	280	*230	150	180	280	295	280
25	650	790	3,060	180	2,620	295	230	150	*205	355	465	*280
26	432	880	2,100	370	925	*230	192	230	295	465	416	295
27	400	*925	*1,189	242	498	230	180	205	610	432	*295	280
28	340	6,138	1,189	230	432	255	880	*180	1,410	650	255	280
29	310	......	1,510	230	*310	242	255	180	400	498	280	370
30	*310	......	1,118	230	530	180	230	180	255	*370	280	3,730
31	255	......	1,070	......	880	......	*230	180	......	340	......	2,445
Mean	749	858	1,535	335	520	518	231	245	296	323	464	434

* Sunday.

Monthly Discharge of Mohawk River at Floyd Ave., Rome, N. Y.
[Drainage area, 158 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum	Mean.	Per square mile.	Depth in inches on drainage area.
1907.					
July	902	158	260	1.65	1.90
August	158	106	148	0.937	1.08
September	812	135	320	2.03	2.27
October	4,055	192	668	4.23	4.86
November	3,915	295	670	4.24	4.75
December	5,740	135	924	5.85	6.73
1908.					
January	530	90	166	1.05	1.21
February	3,880	83	589	3.73	4.03
March	4,235	230	1,249	7.90	9.08
April	2,832	465	1,036	6.55	7.34
May	2,620	230	647	4.09	4.70
June	1,930	230	376	2.38	2.67
July	2,680	192	442	2.80	3.22
August	400	158	218	1.38	1.59
September	432	158	194	1.23	1.38
October	481	165	226	1.43	1.64
November	1,212	192	408	2.58	2.89
December	1,360	280	632	4.00	4.60

Monthly Discharge of Mohawk River at Floyd Ave., Rome, N. Y.—(Continued).
[Drainage area, 158 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1909.					
January	4,345	355	1,002	6.34	7.29
February	5,070	268	1,192	7.54	7.84
March	2,330	255	610	3.86	4.44
April	5,898	498	1,791	11.34	12.70
May	2,930	192	649	4.11	4.73
June	1,118	218	386	2.44	2.73
July	449	192	243	1.54	1.77
August	449	125	183	1.16	1.33
September	242	135	172	1.09	1.22
October	481	172	266	1.68	1.93
November	1,094	192	381	2.41	2.70
December	630	172	387	2.45	2.82
1910.					
January	3,805	255	749	4.74	5.45
February	6,138	230	858	5.43	5.65
March	4,530	340	1,535	9.72	11.18
April	1,070	180	335	2.12	2.37
May	2,620	150	520	3.29	3.78
June	2,270	180	518	3.28	3.67
July	880	180	231	1.46	1.68
August	1,070	150	245	1.55	1.78
September	1,410	158	296	1.87	2.09
October	1,189	180	323	2.04	2.35
November	1,822	205	464	2.94	2.29
December	3,730	150	434	2.75	3.16

BLACK RIVER CANAL FEEDER AT DELTA, N. Y.

Current-meter Discharge Measurements of Black River Canal Feeder at Delta, N. Y.

DATE.	Hydrographer.	REFERENCE POINT READING.			Meter No.	Lateral interval.	Submergence depth.	Area flowing.	Total width.	Computed discharge.
		Beginning.	Ending.	Mean.						
						Feet.		*Square feet.*	*Feet.*	*Second-feet.*
1910.										
Aug. 29	A. R. Patchke	0.80	0.65	0.72	559	2	0.6	69.8	16	34.3
Aug. 29	A. R. Patchke	0.75	0.60	0.68	559	2	0.6	70.2	16	36.2

SCHOHARIE CREEK DRAINAGE BASIN.

DESCRIPTION OF BASIN.

The source of Schoharie creek is about two miles east of Tannersville, at an elevation of 1,940 feet. The source is within about four miles of the easterly escarpment of the Catskill plateau. The stream valley is broad and the slope moderate throughout the upper regions. A small area, which apparently was formerly tributary to Schoharie creek, has been cut off by erosion and has thus become tributary to Kaaterskill. Nearly the entire drainage basin is irregular and precipitous. It is extensively covered with second-growth forests.

The basin of Schoharie creek is largely overlain by slaty rocks, into which water percolates only to a slight depth. The valley soil is largely thin plastic clay, formed by disintegration of the native rocks. Passing from the head waters toward the mouth, Schoharie creek crosses successively the Devonian sedimentary rocks, chiefly of the Catskill, Oneonta, Ithaca and Hamilton formations. All of these may be considered fairly impervious and free from fissures. It then crosses belts of Silurian formations, including Helderberg, Saline, Niagara and Medina sandstone and limestone. These rocks are underlaid by impervious Hudson river shales, but are themselves permeable, yielding numerous springs at the lower partings.

The entire drainage basin is shown on the topographic maps of the U. S. Geological Survey, the elevation and area at different points along the stream being as follows:

*Drainage Area of Schoharie Creek.**

LOCATION.	DISTANCE IN MILES.†			Elevation.	FALL IN FEET.		DRAINAGE AREA IN SQUARE MILES.	
	From mouth.	From Prattsville.	Place to place.		Place to place.	Per mile.	Point to point.‡	Total.
Reservoir site........	64.0	0	......	1,240	......	....	228	228
Prattsville gage......	62.5	1.5	1.5	1,160	80	53.3	10.4	238.4
Devasego Falls......	60.5	3.5	2.0	1,100	60	30.0	8.1	246.5
Gilboa..............	55.5	8.5	5.0	1,000	100	20.0	58.5	305
North Blenheim.....	48.5	15.5	7.0	800	200	22.3	92.9	397.9
Breakabeen.........	43.0	21.0	5.5	710	90	16.4	23.8	421.7
Middleburg.........	35.0	29.0	8.0	620	90	11.2	105.7	527.4
Schoharie...........	29.5	34.5	5.5	590	30	5.5	26.6	554
Mouth of Fox creek.	28.0	36.0	1.5	585	5	3.3	90.5	644.5
Above Cobleskill creek	24.0	40.0	4.0	580	5	1.2	12.8	657.3
Mouth of Cobleskill..	24.0	46.0	0	580	0	....	135.9	793.2
Esperance..........	18.0	46.0	6.0	560	20	3.3	63.2	856.4
Burtonsville.........	14.5	49.5	3.5	520	40	11.4	14	870.4
Mill Point bridge.....	6.0	58.0	8.5	340	180	21.1	30.3	900.7
Mouth (Ft. Hunter)..	0	64.0	6.0	280	60	7.5	8.6	909.3

* From U. S. Geological Survey topographic maps. † Measured along general course of stream. ‡ From head.

The results of gagings of this stream at stations formerly maintained may be found in the report of the State Engineer and Surveyor for 1902, supplement, pages 169–180.

SCHOHARIE CREEK AT FORT HUNTER, N. Y.

A gage was erected on Schoharie creek above the State feeder dam at Fort Hunter, November 17, 1904, by C. A. Poole, of this Department. The gage is maintained in coöperation with the U. S. Weather Bureau. The gage is attached to the downstream wing wall of the right-hand abutment of the West Shore R. R. bridge. It is vertical and divided to feet and tenths and is in two sections, the lower section reading from zero to 3.9, the upper section reading from 3.9 to 16 feet. The zero mark is at elevation 280.5. Readings are taken at 8 A. M. and 6 P. M. each day.

Mean Daily Estimated Inflow, Second-feet, from Schoharie Creek into Mohawk River, at Fort Hunter, N. Y.

DAY.	Nov.	Dec.
1904.		
1		744
2		744
3		744
4		*744
5		744
6		560
7		396
8		396
9		396
10		396
11		*396
12		396
13		396
14		744
15		945
16		945
17		945
18	396	*945
19	396	945
20	*396	945
21	744	945
22	2,179	945
23	1,645	945
24	1,397	1,645
25	1,397	*4,063
26	1,397	2,763
27	*744	2,179
28	560	10,234
29	744	5,521
30	744	2,179
31		2,466
Mean	980	1,527

* Sunday.

Mean Daily Estimated Inflow, Second-feet, from Schoharie Creek into Mohawk River at Fort Hunter, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1905.												
1.....	*1,397	2,179	1,397	7,123	560	25a	138	25a	254	25a	57	3,072
2.....	1,645	2,179	1,645	*4,063	396	25a	*138	138	560	25a	25a	945
3.....	2,466	2,466	1,645	3,072	396	25a	57	57	*254	25a	25a	*2,466
4.....	3,392	2,179	1,645	3,072	254	*25a	57	25a	560	254	57	7,543
5.....	1,906	*2,179	*1,645	4,063	254	25a	25a	25a	3,072	138	*25a	4,413
6.....	1,906	2,179	1,645	5,143	560	25a	25a	*25a	945	138	25a	1,906
7.....	2,719	2,466	1,645	5,143	*560	25a	25a	25a	560	25a	25a	1,645
8.....	*5,909	3,072	1,645	3,392	396	25a	25a	25a	254	*25a	57	1,645
9.....	4,063	3,392	1,645	*2,466	396	25a	*25a	25a	254	25a	138	945
10.....	4,063	3,392	1,645	2,179	254	25a	25a	25a	138	25a	57	*2,466
11.....	4,413	2,763	1,645	2,466	254	*25a	25a	25a	57	25a	57	2,466
12.....	1,645	*2,763	*1,645	5,143	138	25a	744	25a	57	560	*57	945
13.....	7,973	3,722	1,645	3,392	138	25a	138	*25a	560	1,906	57	945
14.....	3,392	2,763	1,645	2,763	*138	25a	138	25a	560	945	25a	945
15.....	*2,466	3,072	1,645	2,466	138	57	57	25a	254	*560	25a	945
16.....	2,179	3,072	1,645	*2,179	396	25a	*25a	560	138	396	25a	945
17.....	3,392	3,072	1,645	1,906	254	25a	25a	1,397	*138	254	25a	*945
18.....	2,466	3,072	1,645	1,645	254	*25a	25a	560	254	138	25a	744
19.....	2,763	*3,072	*14,224	1,645	254	25a	25a	254	560	138	*25a	744
20.....	2,763	2,763	8,410	1,397	254	25a	25a	*138	945	254	57	744
21.....	2,179	2,179	5,143	1,397	*138	25a	25a	57	1,906	396	25a	560
22.....	*1,397	2,179	3,072	1,397	138	1,906	25a	57	945	*560	25a	945
23.....	1,397	1,906	2,466	*1,397	57	1,906	*25a	25a	744	396	25a	1,906
24.....	945	1,906	2,763	945	138	945	25a	25a	*396	254	25a	*1,906
25.....	945	1,906	18,630	945	138	*560	25a	25a	254	254	25a	744
26.....	945	*1,397	*14,753	945	57	560	25a	25a	254	138	*25a	744
27.....	1,163	1,397	14,224	744	25a	560	25a	*25a	138	138	25a	744
28.....	1,163	1,397	10,708	744	*25a	560	25a	25a	138	138	25a	560
29.....	*1,163	......	10,234	744	57	254	25a	25a	57	*138	25a	945
30.....	2,179	......	12,677	*744	25a	138	*25a	25a	57	138	560	1,163
31.....	2,179	......	10,708	......	25a	......	25a	25a	......	138	......	*945
Mean..	2,517	2,503	5,076	2,490	228	265	66	105	543	276	55	1,543

a Estimated leakage; no overflow. * Sunday.

Mean Daily Estimated Inflow, Second-feet, from Schoharie Creek into Mohawk River at Fort Hunter, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1906.												
1.....	744	945	2,179	*5,521	254	1,397	*1,163	25a	57	25a	254	945
2.....	560	945	1,906	4,773	254	1,397	945	25a	*25a	25a	254	*2,179
3.....	396	945	1,163	4,413	3,072	*915	560	25a	25a	25a	138a	1,645
4.....	560	*945	*16,931	4,063	1,906	744	560	25a	25a	25a	*138	1,645
5.....	1,397	945	5,909	4,413	1,397	560	744	*25a	25a	25a	57	1,163
6.....	945	945	4,413	6,710	945	945	560	25a	25a	25a	25a	1,163
7.....	*945	945	3,392	5,521	396	945	254	25a	25a	*25a	25a	4,773
8.....	560	945	3,072	*5,521	396	560	*138	25a	25a	25a	25a	3,392
9.....	744	945	2,179	5,521	396	560	138	57	*25a	25a	138	*1,906
10.....	744	945	2,179	5,521	560	*744	57	25a	25a	25a	25a	1,163
11.....	945	*945	*2,179	7,543	560	1,397	57	25a	25a	25a	*25a	945
12.....	945	945	1,906	8,410	396	744	57	*25a	25a	25a	57	945
13.....	1,163	945	1,645	6,710	*254	560	57	25a	25a	25a	57	2,466
14.....	*1,397	945	1,645	5,909	254	396	25a	25a	25a	*25a	57	3,392
15.....	1,397	945	1,645	*8,410	254	254	*25a	25a	25a	25a	57	4,063
16.....	1,163	945	1,645	11,190	254	945	25a	25a	*25a	25a	25a	*7,543
17.....	1,397	945	1,645	6,710	254	*4,063	25a	25a	25a	25a	138	4,773
18.....	1,397	*945	*1,645	4,413	254	3,392	25a	25a	25a	25a	*945	3,072
19.....	1,163	945	1,397	4,413	254	3,072	25a	*25a	25a	25a	8,855	1,645
20.....	1,163	945	1,397	3,722	*254	1,906	25a	25a	25a	25a	4,063	1,397
21.....	*1,645	1,645	1,397	3,722	254	1,397	25a	25a	25a	*25a	3,392	1,906
22.....	4,773	6,305	1,397	*3,072	254	945	*25a	25a	25a	744	12,174	3,722
23.....	4,773	6,710	1,397	2,466	57	945	25a	25a	*25a	396	2,763	*3,392
24.....	5,909	5,143	1,397	2,179	138	*945	25a	25a	25a	254	1,645	2,763
25.....	3,072	*3,072	*1,397	1,906	57	560	25a	25a	25a	138	*1,163	2,179
26.....	1,906	3,392	1,397	1,397	57	560	25a	*25a	25a	396	945	2,763
27.....	2,463	2,466	5,909	945	*949	254	25a	25a	25a	396	945	3,072
28.....	*1,397	2,179	11,679	560	5,909	254	25a	25a	25a	*396	945	3,392
29.....	1,906	......	5,143	*560	7,123	138	*25a	560	25a	396	945	3,392
30.....	1,906	......	5,143	254	3,722	254	25a	138	*25a	138	945	*3,722
31.....	1,163	......	7,543	......	1,906	......	25a	138	.....	138	....	4,773
Mean..	1,633	1,779	3,160	4,549	1,064	1,059	188	50	29	126	1,374	2,751

a Estimated leakage; no overflow. * Sunday.

Mean Daily Estimated Inflow, Second-feet, from Schoharie Creek into Mohawk River at Fort Hunter N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	18,457	1,397	2,040	2,466	2,179	396	25*a*	25*a*	*25*a*	744	1,906	*744
2	7,756	1,397	2,915	1,773	1,773	*320	138	25*a*	25*a*	473	1,518	744
3	7,123	*1,518	*2,179	1,518	1,645	744	138	25*a*	25*a*	320	*4,773	744
4	10,470	2,040	1,773	1,397	1,397	1,906	30	*25*a*	25*a*	1,397	4,956	744
5	4,413	2,040	2,466	1,397	*2,179	1,163	25*a*	25*a*	25*a*	1,906	2,466	744
6	*2,763	1,645	2,040	1,397	1,518	1,051	25*a*	25*a*	25*a*	*1,163	2,763	744
7	1,906	1,645	1,518	*1,163	1,397	1,163	*25*a*	25*a*	138	841	25,943	744
8	2,763	1,645	1,397	945	2,179	945	25*a*	25*a*	*89	744	9,307	*744
9	2,763	1,645	1,397	945	1,773	*744	25*a*	25*a*	25*a*	1,906	4,956	744
10	2,040	*1,645	*1,645	945	1,645	649	25*a*	25*a*	25*a*	1,163	*4,236	12,525
11	1,773	1,645	1,397	1,163	1,518	560	25*a*	*25*a*	25*a*	841	3,722	14,224
12	2,179	1,645	945	1,518	*1,397	560	57	25*a*	473	744	3,072	5,330
13	*1,773	1,645	945	2,040	1,051	560	744	25*a*	744	*841	1,773	2,763
14	2,179	1,645	4,956	*3,072	841	320	*254	25*a*	254	744	841	2,040
15	2,040	1,640	7,756	2,763	744	254	138	25*a*	*138	560	649	*1,645
16	1,518	1,645	4,413	2,320	560	*138	25*a*	25*a*	89	396	945	1,518
17	1,163	*1,906	*3,555	2,763	841	138	25*a*	25*a*	25*a*	396	*945	1,397
18	649	3,392	3,891	2,320	1,051	89	25*a*	*25*a*	25*a*	254	945	1,163
19	1,277	2,763	2,612	2,040	*945	89	25*a*	25*a*	25*a*	190	945	1,163
20	*5,031	1,518	1,773	1,906	945	89	138	25*a*	25*a*	*138	945	1,163
21	2,915	2,179	1,518	*1,645	841	138	*25*a*	25*a*	25*a*	138	744	1,163
22	1,277	1,645	1,906	1,518	560	57	138	25*a*	*25*a*	254	744	*1,163
23	1,051	1,397	4,063	1,773	560	*25*a*	30	25*a*	25*a*	190	744	1,163
24	1,397	*1,397	*4,236	7,123	473	25*a*	25*a*	25*a*	25*a*	57	*744	5,909
25	1,397	1,397	3,230	5,713	396	25*a*	25*a*	*25*a*	57	138	744	5,330
26	1,397	1,397	3,072	4,063	*396	25*a*	25*a*	25*a*	190	138	744	3,392
27	*1,518	1,397	2,763	6,710	841	25*a*	25*a*	25*a*	57	*138	744	2,320
28	2,179	1,397	3,722	*3,392	1,051	25*a*	*25*a*	25*a*	138	473	744	4,236
29	2,179	....	6,305	2,466	841	25*a*	25*a*	25*a*	*25*a*	8,855	744	*4,956
30	1,906	....	4,773	1,906	560	*25*a*	25*a*	25*a*	945	5,330	744	4,956
31	1,645	....	*3,722	....	396	....	25*a*	25*a*	....	2,612	....	4,591
Mean	3,190	1,724	2,933	2,372	1,113	4,091	75	25	125	1,043	2,835	3,033

a Estimated leakage; no overflow. * Sunday.

Mean Daily Estimated Inflow, Second-feet, from Schoharie Creek into Mohawk River at Fort Hunter N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
1	4,063	1,397	* 1,163	3,072	8,855	1,277	25*a*	25*a*	25*a*	25*a*	*841	25*a*
2	2,612	* 1,163	1,163	3,072	4,236	841	25*a*	*25*a*	25*a*	25*a*	396	25*a*
3	1,518	1,163	1,163	2,612	*3,722	560	25*a*	25*a*	25*a*	320	473	25*a*
4	1,277	1,163	1,163	2,179	3,072	560	25*a*	25*a*	25*a*	*25*a*	473	25*a*
5	*1,163	1,163	1,163	*1,773	2,040	396	*25*a*	25*a*	25*a*	25*a*	25*a*	25*a*
6	1,277	1,163	1,163	2,040	1,645	254	25*a*	25*a*	*25*a*	25*a*	25*a*	*25*a*
7	1,397	1,163	1,163	2,040	2,040	*138	89	25*a*	25*a*	25*a*	25*a*	25*a*
8	1,397	1,163	* 1,163	2,320	7,543	138	25*a*	25*a*	25*a*	25*a*	*25*a*	25*a*
9	1,397	* 1,163	1,163	5,521	5,143	89	25*a*	*25*a*	25*a*	25*a*	25*a*	25*a*
10	1,277	1,163	1,163	4,063	*3,555	57	25*a*	25*a*	25*a*	25*a*	25*a*	25*a*
11	1,051	1,163	1,163	3,392	2,915	89	25*a*	25*a*	25*a*	*25*a*	25*a*	25*a*
12	*841	1,163	2,040	*2,915	2,179	138	*25*a*	25*a*	25*a*	25*a*	25*a*	25*a*
13	1,163	1,163	15,126	2,320	1,645	25*a*	25*a*	25*a*	*25*a*	25*a*	25*a*	*57
14	1,051	1,163	12,677	2,040	1,906	*25*a*	25*a*	25*a*	25*a*	25*a*	25*a*	396
15	945	25,751	*12,424	1,645	3,072	25*a*	25*a*	25*a*	25*a*	25*a*	*25*a*	396
16	945	*16,931	10,234	1,645	2,040	25*a*	25*a*	*25*a*	25*a*	25*a*	25*a*	396
17	945	8,190	4,956	1,645	*1,645	25*a*	25*a*	25*a*	25*a*	25*a*	25*a*	396
18	945	2,466	2,915	1,397	1,277	138	25*a*	25*a*	25*a*	*25*a*	25*a*	396
19	*841	1,397	2,320	*1,397	945	25*a*	*25*a*	25*a*	25*a*	25*a*	25*a*	396
20	744	1,397	3,072	1,645	945	25*a*	25*a*	25*a*	*25*a*	25*a*	25*a*	*138
21	744	1,397	2,320	1,645	945	*25*a*	25*a*	25*a*	25*a*	25*a*	25*a*	320
22	1,397	1,397	* 2,179	1,645	945	25*a*	25*a*	25*a*	25*a*	25*a*	*25*a*	560
23	2,612	* 1,163	2,466	1,518	4,956	25*a*	25*a*	*25*a*	25*a*	25*a*	25*a*	560
24	2,040	1,163	4,956	1,397	*2,612	25*a*	25*a*	25*a*	25*a*	25*a*	25*a*	560
25	1,773	1,163	5,143	1,397	1,773	25*a*	25*a*	25*a*	25*a*	*25*a*	25*a*	560
26	*1,645	1,163	4,063	*1,397	1,397	25*a*	*25*a*	25*a*	25*a*	25*a*	25*a*	396
27	1,645	1,163	6,506	1,397	1,051	25*a*	25*a*	25*a*	*25*a*	25*a*	25*a*	*254
28	1,645	1,163	7,123	1,518	945	*25*a*	25*a*	25*a*	25*a*	25*a*	25*a*	138
29	1,518	1,163	* 6,506	2,040	841	25*a*	25*a*	25*a*	25*a*	560	*25*a*	138
30	1,397	....	6,506	1,645	649	25*a*	25*a*	*25*a*	25*a*	841	25*a*	254
31	1,397	....	4,236	....	*560	....	25*a*	25*a*	.....	473	......	396
Mean	1,441	2,882	4,212	2,144	2,487	170	27.1	25	25	92	94	224

a Estimated leakage; no overflow. * Sunday.

Mean Daily Estimated Inflow, Second-feet, from Schoharie Creek into Mohawk River at Fort Hunter. N. Y.

DAY.	Jan.	Feb.*b*	Mar.*b*	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1....	138	......	......	*b*	3,072	560	25*a*	*25*a*	25*a*	25*a*	25*a*	25*a*
2....	254	......	......	*b*	*5,330	473	25*a*	25*a*	25*a*	25*a*	25*a*	25*a*
3....	*138	......	......	*b*	3,555	396	25*a*	25*a*	25*a*	*25*a*	25*a*	25*a*
4....	138	......	......	**b*	4,956	396	*25*a*	25*a*	25*a*	25*a*	25*a*	25*a*
5....	1,277	......	......	*b*	3,722	560	25*a*	25*a*	*25*a*	25*a*	25*a*	*25*a*
6....	11,925	......	......	*b*	3,230	*560	25*a*	25*a*	25*a*	25*a*	25*a*	25*a*
7....	6,105	*	*	*b*	4,236	560	25*a*	25*a*	25*a*	25*a*	**b*	25*a*
8....	2,466	......	......	*b*	3,072	396	25*a*	*25*a*	25*a*	25*a*	25*a*	25*a*
9....	1,773	......	......	*b*	*2,320	320	25*a*	25*a*	25*a*	25*a*	25*a*	25*a*
10....	*11,163	......	......	*b*	2,763	396	25*a*	25*a*	25*a*	*25*a*	25*a*	25*a*
11....	1,645	......	......	**b*	6,710	649	*25*a*	25*a*	25*a*	25*a*	25*a*	25*a*
12....	1,645	......	......	*b*	3,722	1,051	25*a*	25*a*	*25*a*	25*a*	25*a*	*25*a*
13....	1,645	......	......	*b*	2,320	*744	25*a*	25*a*	25*a*	25*a*	25*a*	25*a*
14....	1,645	*	*	*b*	1,906	1,163	25*a*	25*a*	25*a*	25*a*	*25*a*	30
15....	1,645	......	......	*b*	1,645	1,051	25*a*	*25*a*	25*a*	25*a*	25*a*	25*a*
16....	1,645	......	......	*b*	*2,040	841	25*a*	25*a*	25*a*	25*a*	396	25*a*
17....	*1,645	......	......	*b*	2,763	649	25*a*	25*a*	25*a*	*25*a*	25*a*	89
18....	1,645	......	......	**b*	2,466	1,163	*25*a*	25*a*	25*a*	25*a*	25*a*	190
19....	1,645	......	......	*b*	2,040	1,773	25*a*	25*a*	*25*a*	25*a*	25*a*	*30
20....	1,645	......	......	*b*	1,773	*1,277	25*a*	25*a*	25*a*	25*a*	25*a*	25*a*
21....	1,645	*	*	*b*	1,645	744	25*a*	25*a*	25*a*	25*a*	*25*a*	25*a*
22....	1,645	......	......	*b*	1,645	649	25*a*	*25*a*	25*a*	25*a*	25*a*	25*a*
23....	1,645	......	......	*b*	*1,397	1,051	25*a*	25*a*	25*a*	25*a*	25*a*	190
24....	*10,234	......	......	*b*	1,397	1,397	25*a*	25*a*	25*a*	*25*a*	25*a*	89
25....	8,855	......	......	*1,645	1,397	560	*25*a*	25*a*	25*a*	25*a*	25*a*	30
26....	7,132	......	......	1,645	1,051	190	25*a*	25*a*	*25*a*	25*a*	25*a*	*89
27....	5,143	......	......	1,518	649	*57	25*a*	25*a*	25*a*	25*a*	25*a*	57
28....	3,891	*	*	1,773	649	25*a*	25*a*	25*a*	25*a*	25*a*	*25*a*	57
29....	2,915	......	......	1,645	560	25*a*	25*a*	*25*a*	25*a*	25*a*	25*a*	25*a*
30....	2,040	......	......	1,773	*649	25*a*	25*a*	25*a*	25*a*	25*a*	25*a*	25*a*
31....	**b*	......	......	......	649	......	25*a*	25*a*	......	*25*a*	......	30
Mean..	3,232	......	......	1,667	2,752	653	25	25	25	25	38	45

a Estimated leakage; no overflow. *b* No record for February and March. * Sunday.

Mean Daily Estimated Inflow, Second-feet, from Schoharie Creek into Mohdwk River at Fort Hunter, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1...	30	649	16,931	2,179	*1,397	1,773	1,163	25*a*	25*a*	25*a*	25*a*	254
2...	*25*a*	945	13,702	1,645	1,163	1,397	841	25*a*	25*a*	*25*a*	25*a*	320
3...	25*a*	945	9,999	*1,277	744	1,277	*945	25*a*	25*a*	25*a*	25*a*	138
4...	30	841	6,710	744	1,773	945	841	25*a*	*25*a*	25*a*	25*a*	*190
5...	25*a*	841	5,521	649	1,773	*1,397	744	25*a*	25*a*	25*a*	25*a*	89
6...	649	*841	*5,909	841	1,645	2,179	396	25*a*	25*a*	25*a*	*25*a*	25*a*
7...	30	1,051	11,190	841	1,051	2,320	1,163	*25*a*	25*a*	25*a*	25*a*	25*a*
8...	25*a*	1,397	7,543	2,040	*1,163	1,518	57	25*a*	25*a*	25*a*	25*a*	25*a*
9...	*25*a*	1,906	4,413	1,645	254	1,051	57	25*a*	25*a*	*25*a*	25*a*	25*a*
10...	25*a*	2,320	3,392	*1,163	649	473	*57	25*a*	25*a*	25*a*	30	25*a*
11...	25*a*	1,773	2,763	1,397	744	1,397	25*a*	25*a*	*25*a*	25*a*	841	*25*a*
12...	25*a*	1,518	2,466	1,397	649	*3,722	25*a*	25*a*	25*a*	25*a*	2,320	25*a*
13...	1,277	*1,397	*2,320	1,277	560	2,179	......	25*a*	25*a*	25*a*	*2,612	25*a*
14...	1,397	1,397	2,320	1,163	473	1,163	......	*25*a*	25*a*	25*a*	2,466	25*a*
15...	190	1,397	2,320	1,397	*560	744	......	25*a*	25*a*	25*a*	1,906	25*a*
16...	*25*a*	1,773	2,040	841	396	396	......	25*a*	25*a*	*25*a*	1,518	25*a*
17...	25*a*	3,555	1,773	*945	320	1,906	*	25*a*	25*a*	25*a*	1,163	25*a*
18...	30	3,555	1,277	2,612	254	3,230	......	25*a*	*25*a*	25*a*	841	*25*a*
19...	89	2,763	1,163	8,410	320	*4,591	......	25*a*	25*a*	25*a*	396	25*a*
20...	2,612	*2,466	*3,230	4,413	396	3,392	......	25*a*	25*a*	25*a*	*320	25*a*
21...	1,518	3,230	3,555	1,397	138	2,320	......	*25*a*	25*a*	25*a*	254	25*a*
22...	22,185	7,331	2,763	1,163	*320	1,397	......	25*a*	25*a*	25*a*	190	25*a*
23...	*9,767	6,105	2,763	1,518	138	1,397	25*a*	25*a*	25*a*	*25*a*	254	25*a*
24...	5,143	2,612	3,891	*1,163	138	1,518	*25*a*	25*a*	25*a*	25*a*	320	25*a*
25...	2,612	2,040	5,521	1,051	320	1,397	25*a*	25*a*	*25*a*	25*a*	190	*25*a*
26...	4,413	1,906	5,909	13,443	473	*1,277	25*a*	25*a*	25*a*	25*a*	473	25*a*
27...	1,397	*1,645	*3,891	9,307	473	1,645	25*a*	25*a*	25*a*	25*a*	*190	25*a*
28...	560	46,888	2,763	5,909	473	1,397	25*a*	*25*a*	25*a*	25*a*	320	25*a*
29...	1,051	......	2,179	11,679	*396	1,397	25*a*	25*a*	25*a*	25*a*	744	25*a*
30...	*945	......	2,612	1,645	841	1,163	25*a*	25*a*	25*a*	*25*a*	649	25*a*
31...	841	......	2,612	......	945	......	*25*a*	25*a*	......	25*a*	......	25*a*
Mean.	1,839	3,753	4,692	2,840	675	1,732	311	25	25	25	607	53

a Estimated leakage; no overflow. * Sunday.

Monthly Estimated Inflow of Schoharie Creek into Mohawk River at Fort Hunter, N. Y.

[Drainage area, 909 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1904.					
December	10,234	396	1,527	1.68	1.93
1905.					
January	7,973	945	2,517	2.77	3.19
February	3,722	1,397	2,503	2.75	2.86
March	18,630	1,397	5,076	5.58	6.43
April	7,123	744	2,490	2.74	3.06
May	560	25[a]	228	0.251	0.289
June	1,906	25[a]	265	0.292	0.326
July	744	25[a]	66	0.073	0.084
August	1,397	25[a]	105	0.116	0.134
September	3,072	57	543	0.597	0.666
October	1,906	25[a]	276	0.304	0.350
November	560	25[a]	55	0.061	0.068
December	7,543	560	1,543	1.70	1.96
1906.					
January	5,909	396	1,633	1.80	2.07
February	6,710	945	1,774	1.95	2.03
March	11,679	1,163	3,160	3.48	4.00
April	11,190	254	4,549	5.00	5.60
May	7,123	57	1,064	1.17	1.35
June	4,063	138	1,059	1.16	1.30
July	1,163	25[a]	188	0.21	0.24
August	560	25[a]	50	0.06	0.07
September	57	25[a]	29	0.03	0.03
October	744	25[a]	126	0.14	0.16
November	12,174	25[a]	1,374	1.51	1.69
December	7,543	945	2,751	3.03	3.48
1907.					
January	18,457	649	3,190	3.51	4.05
February	3,392	1,397	1,724	1.90	1.98
March	7,756	945	2,933	3.23	3.72
April	7,123	945	2,372	2.61	2.91
May	2,179	396	1,113	1.22	1.41
June	1,906	25[a]	409	0.450	0.502
July	744	25[a]	75	0.082	0.094
August	25[a]	25[a]	25[a]	0.028	0.032
September	945	25[a]	125	0.138	0.154
October	8,855	57	1,043	1.15	1.33
November	25,943	649	2,835	3.12	3.48
December	14,224	744	3,033	3.34	3.85
1908.					
January	4,063	744	1,441	1.58	1.82
February	25,751	1,163	2,882	3.17	3.42
March	15,126	1,163	4,212	4.63	5.32
April	5,521	1,397	2,144	2.36	2.64
May	8,855	560	2,487	2.74	3.15
June	1,277	25[a]	170	0.19	0.21
July	89	25[a]	27	0.03	0.03
August	25[a]	25[a]	25[a]	0.03	0.03
September	25[a]	25[a]	25[a]	0.03	0.03
October	841	25[a]	92	0.10	0.12
November	841	25[a]	94	0.10	0.11
December	560	25[a]	224	0.25	0.29
1909.[b]					
January	10,234	138	3,232	3.56	4.10
May	6,710	560	2,752	3.03	3.49
June	1,773	25[a]	653	0.718	0.801
July	25[a]	25[a]	25[a]	0.028	0.032
August	25[a]	25[a]	25[a]	0.028	0.032
September	25[a]	25[a]	25[a]	0.028	0.031
October	25[a]	25[a]	25[a]	0.028	0.032
November	396	25[a]	38	0.042	0.047
December	190	25[a]	45	0.050	0.058

[a] Estimated leakage; no overflow.

[b] No record February to April.

Monthly Estimated Inflow of Schoharie Creek into Mohawk River at Fort Hunter, N. Y.—(Con).
[Drainage area, 909 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
January	22,185	25*a*	1,839	2.02	2.32
February	46,888	649	3,753	4.13	4.30
March	16,931	1,163	4,692	5.16	5.93
April	13,443	649	2,840	3.12	3.49
May	1,773	138	675	0.743	0.854
June	4,591	396	1,732	1.91	2.14
July	1,163	25*a*	311	0.579	0.666
August	25*a*	25*a*	25*a*	0.028	0.032
September	25*a*	25*a*	25*a*	0.028	0.031
October	25*a*	25*a*	25*a*	0.028	0.032
November	2,612	25*a*	607	0.668	0.748
December	320	25*a*	53	0.058	0.067

a Estimated leakage; no overflow.

Current-meter Discharge Measurements of Erie Canal Feeder at Fort Hunter, N. Y.

DATE.	Hydrographer.	REFERENCE POINT READING.			Meter No.	Lateral interval.	Sub-mergence depth.	Area flowing.	Total width.	Computed discharge.
		Beginning.	Ending.	Mean.						
						Feet.		*Square feet.*	*Feet.*	*Second-feet.*
1910.										
June 25	Clark & Haywood	7.2	7.2	7.2	462	2	0.6	14.3	36	99.4
July 11	A. R. Patchke	9.3	9.3	9.3	559	2	0.6	72.9	32.5	164

SCHOHARIE CREEK AT MIDDLEBURG, N. Y.

A temporary gaging station was established at Middleburg August 24, 1906, by Robert E. Horton for this Department. The gage consists of an enameled steel scale subdivided to hundredths of a foot, which is attached vertically to a pile forming part of the shore protection on the right-hand bank of the stream, about 300 feet below Middleburg bridge. The zero mark of the gage is 27.6 feet below the top of the iron rod at the upper end of the pile. The stream channel is straight for a considerable distance below and above the gage. The bed is of gravel and cobblestones fairly smooth and permanent. The stream is confined near the right bank during low water and measurements are made by boat or by wading opposite the gage. At ordinary high stages the stream can be measured from the Middleburg bridge. Gage readings are taken each morning and night by Minnie E. Wheeler.

Mean Daily Gage Height, in Feet, of Schoharie Creek at Middleburg, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	1.55	2.62	8.00	3.50	3.35	2.25	1.68	0.95	0.75	1.00	0.90	1.85
2......	1.62	2.55	7.15	3.12	3.22	2.32	1.60	0.90	0.80	0.95	0.85	1.80
3......	1.70	2.50	6.00	2.85	3.15	2.20	1.55	0.90	0.90	0.90	0.90	1.68
4......	1.65	2.50	5.00	2.68	3.50	2.00	1.52	0.85	0.95	0.90	1.10	1.60
5......	1.70	2.38	4.75	2.60	3.35	1.92	1.45	0.90	1.08	0.90	2.18	1.62
6......	2.12	2.20	4.80	2.65	2.98	3.00	1.40	0.92	1.22	0.90	2.90	1.58
7......	4.18	2.12	6.93	3.50	2.78	2.95	1.35	0.90	1.10	0.90	2.50	1.60
8......	4.02	2.35	5.52	3.30	2.60	2.65	1.30	0.90	1.02	0.90	2.15	1.60
9......	3.55	2.40	4.22	2.95	2.62	2.45	1.25	0.90	1.00	0.85	2.00	1.60
10......	3.35	2.50	3.72	2.85	2.82	2.32	1.28	0.85	0.95	0.85	2.00	1.60
11......	2.90	2.45	3.38	2.85	2.68	2.45	1.22	1.00	0.95	0.85	3.75	1.60
12......	2.88	2.28	3.30	3.50	2.55	3.35	1.12	1.00	0.90	0.85	2.90	1.55
13......	2.82	2.10	3.20	3.05	2.38	3.05	1.10	1.05	0.92	0.85	2.55	1.50
14......	2.78	2.18	3.28	2.85	2.25	2.78	1.05	0.98	1.20	0.85	2.35	1.45
15......	2.70	2.10	2.98	2.70	2.20	2.62	1.05	0.92	1.42	0.80	2.22	1.48
16......	2.65	2.15	2.75	2.65	2.08	3.00	1.00	0.90	1.22	0.80	2.15	1.60
17......	2.55	3.35	2.75	2.62	2.00	3.05	1.00	0.90	1.12	0.80	2.08	1.62
18......	2.58	3.15	2.60	2.62	1.92	4.75	1.00	0.85	1.05	0.80	1.95	1.48
19......	3.92	2.88	2.62	5.32	2.00	4.12	1.00	0.85	1.02	0.80	1.85	1.35
20......	4.10	2.92	2.90	4.35	1.85	3.38	1.00	0.80	1.00	0.80	1.82	1.40
21......	3.85	4.28	3.60	3.60	1.85	2.95	0.95	0.85	0.98	0.80	1.72	1.40
22......	10.73	8.25	3.42	3.10	1.82	2.72	1.00	0.85	0.95	0.80	1.68	1.62
23......	5.68	9.75	3.48	2.98	1.78	2.68	1.00	0.85	0.95	0.85	1.78	1.45
24......	4.40	8.00	3.65	2.78	1.78	2.40	1.00	0.85	0.90	0.85	1.75	1.52
25......	3.80	7.25	4.30	2.80	1.78	2.15	1.00	0.80	0.90	0.90	1.80	3.05
26......	3.35	7.00	4.70	10.95	2.15	2.00	1.00	0.80	1.05	0.90	1.90	4.35
27......	3.25	9.64	3.92	6.00	2.00	1.90	1.00	0.80	1.10	0.85	1.78	4.20
28......	3.02	11.17	3.55	4.65	1.88	2.10	1.00	0.75	1.12	0.90	1.75	4.08
29......	2.82	......	3.40	3.98	1.72	2.00	1.00	0.75	1.20	0.90	1.80	4.00
30......	2.70	......	3.70	3.72	1.85	1.82	1.00	0.75	1.10	0.90	1.88	7.50
31......	2.68	......	3.72	......	2.30	......	1.00	0.75	......	0.90	......	4.80

Mean Daily Discharge, Second-feet, of Schoharie Creek af Middleburg, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	134	648	*a*	1,400	1,262	418	172	26	11	31	22	230
2......	156	598	8,420	1,055	1,147	459	148	22	14	26	18	215
3......	180	565	5,400	810	1,078	390	134	22	22	22	22	172
4......	164	565	3,500	682	1,400	300	127	18	26	22	42	148
5......	180	486	3,050	630	1,262	260	108	22	39	22	379	156
6......	356	390	3,150	665	920	940	95	24	60	22	850	141
7......	2,225	356	7,790	1,400	757	890	84	22	42	22	565	148
8......	2,025	472	4,450	1,216	630	665	74	22	34	22	368	148
9......	1,460	500	2,285	890	648	532	65	22	31	18	300	148
10......	1,262	565	1,670	810	795	459	70	18	26	18	300	148
11......	850	532	1,285	810	682	532	60	31	26	18	1,700	148
12......	830	431	1,216	1,400	598	1,262	46	31	22	18	850	134
13......	795	345	1,124	986	486	986	42	36	24	18	598	120
14......	757	379	1,193	810	418	757	36	29	56	18	472	108
15......	700	345	920	700	390	648	36	24	101	14	404	141
16......	665	368	735	665	334	940	31	22	60	14	368	148
17......	598	1,262	735	648	300	986	31	22	46	14	334	156
18......	614	1,078	630	648	260	3,050	31	18	36	14	270	114
19......	1,915	830	648	4,060	300	2,160	31	18	34	14	230	84
20......	2,120	870	850	2,460	230	1,285	31	14	31	14	222	95
21......	1,800	2,360	1,520	1,520	230	890	26	18	29	14	188	95
22......	*a*	*a*	1,331	1,032	222	718	31	18	26	14	172	156
23......	4,750	*a*	1,377	920	206	682	31	18	26	18	206	108
24......	2,520	*a*	1,580	757	206	500	31	18	22	18	196	127
25......	1,750	8,700	2,400	780	206	368	31	14	22	22	215	986
26......	1,262	8,000	3,000	*a*	368	300	31	14	36	22	250	2,460
27......	1,170	*a*	1,915	5,400	300	250	31	14	42	18	206	250
28......	963	*a*	1,460	2,900	240	315	31	11	46	22	196	2,085
29......	795	......	1,308	1,970	188	300	31	11	56	22	215	2,000
30......	700	......	1,640	1,670	230	222	31	11	42	22	240	9,400
31......	682	......	1,670	......	445	......	31	11	......	22	......	3,150
Mean...	1,146	1,332	2,275	1,369	540	750	53	20	36	19	347	829

a Gage height exceeds limits of rating table.

Monthly Discharge of Schoharie Creek at Middleburg, N. Y.
[Drainage area, 527 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
January	4,750	134	1,146	2.17	2.50
February	8,700	345	1,332	2.53	2.635
March	8,420	630	2,275	4.32	4.98
April	5,400	630	1,369	2.60	2.901
May	1,400	188	540	1.02	1.176
June	3,050	222	750	1.42	1.584
July	172	26.5	57.7	0.109	0.126
August	36	11	20.1	0.038	0.044
September	101	11	36.3	0.069	0.077
October	31	14.2	19.3	0.037	0.043
November	1,700	18.1	347	0.658	0.734
December	9,400	84	829	1.57	1.81

SCHOHARIE CREEK AT PRATTSVILLE, N. Y.

Schoharie creek above Prattsville drains a rugged, mountainous area, almost entirely wooded. The watershed, 238 square miles in extent, lies wholly within Greene county. Rocks of the Catskill formation, chiefly sandstones and conglomerates, lie at or near the surface over most of the area. The basin is surrounded by nearly continuous mountain ranges, and intervening ridges divide the main stream from its principal tributaries — Batavia kill, East kill and West kill.

The gaging station was established November 7, 1902, by Robert E. Horton for the U. S. Geological Survey in coöperation with the New York Water Supply Department, on the highway bridge at Prattsville. It was assumed and continued by the Board of Water Supply of the city of New York on May 7, 1907, at which time a new standard Board of Water Supply chain gage was installed. The old datum was preserved and the present readings conform to those already obtained.

The gage is attached to the floor of the bridge on the up-stream side near the left bank. The chain length is 27.05 feet. The elevation of the datum of the gage is 1,130.03 (U. S. G. S. B. M.). The gage datum is referred to a bench-mark — a circle of white paint marked on a boulder at the right end of the downstream side of the bridge, elevation 1,151.00, or 20.97 above the datum of the gage.

Gage readings are made each morning and evening by Miss Edna M. Snyder of Prattsville, N. Y.

The bridge is a single span steel highway bridge, 187.8 feet between abutments, and all the water passes between them at all but the very highest stages.

In high water measurements are made from the bridge, while in low water stages they may be made by wading at a point about 500 feet below the bridge.

Mean Daily Discharge, Second-feet, of Schoharie Creek at Prattsville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1......	225	565	551	470	945	177	118	19	31	43	31	48
2......	145	670	512	452	990	138	106	15	29	35	29	19
3......	185	881	440	488	945	153	85	17	35	41	29	29
4......	250	849	392	579	1,380	193	80	19	29	35	27	23
5......	670	769	1,170	452	1,017	205	80	19	23	35	23	23
6......	2,675	1,233	1,215	530	1,380	235	73	23	10	35	27	21
7......	990	1,053	691	1,323	929	193	66	19	10	23	25	50
8......	530	446	410	1,350	881	153	73	19	10	23	29	37
9......	300	428	335	1,125	691	177	57	17	8	31	29	24
10......	275	1,450	2,725	705	670	315	43	17	12	23	27	10
11......	250	1,400	2,325	452	1,520	512	50	15	19	23	29	50
12......	350	849	1,500	392	881	335	43	10	19	23	35	50
13......	275	593	600	380	691	265	43	10	29	23	27	50
14......	275	428	500	6,340	551	512	50	10	23	23	25	195
15......	670	881	452	4,128	551	392	61	10	35	23	23	440
16......	275	1,341	392	2,300	635	335	50	21	29	29	19	237
17......	300	1,305	335	1,260	721	265	43	31	25	29	19	165
18......	410	905	305	1,053	670	990	43	181	23	31	19	175
19......	565	905	275	905	530	649	35	138	21	35	23	92
20......	705	6,500	275	769	470	470	39	90	19	29	27	67
21......	565	2,350	265	649	410	380	39	66	23	29	25	83
22......	530	1,170	217	621	410	325	35	50	19	31	23	95
23......	745	929	177	691	452	265	43	52	15	29	27	95
24......	2,350	2,175	118	600	380	235	43	43	23	39	25	95
25......	1,680	1,380	2,388	512	325	193	29	46	29	37	23	95
26......	691	1,053	1,450	488	285	153	35	43	19	37	23	95
27......	621	929	990	452	265	106	21	37	23	35	27	83
28......	565	721	881	649	440	128	19	31	61	31	41	83
29......	530	......	849	621	350	153	23	29	106	23	39	83
30......	452	......	635	621	265	138	21	29	66	25	43	89
31......	428	......	530	......	250	......	23	23	......	27	......	116
Mean...	628	1,220	771	1,045	674	291	51	37	27	30	28	91

Mean Daily Discharge, Second-feet, of Schoharie Creek at Prattsville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	43	335	5,020	945	801	275	161	41	31	50	88	205
2......	48	310	3,760	721	721	305	153	41	31	48	73	193
3......	48	295	2,388	600	649	265	131	48	43	43	66	217
4......	43	285	1,610	512	999	217	125	71	61	41	98	217
5......	43	265	1,360	488	785	225	118	57	61	41	705	235
6......	165	255	1,380	512	635	512	109	52	61	43	572	275
7......	500	464	3,115	1,500	551	404	106	50	61	43	512	285
8......	324	452	1,400	865	677	320	101	52	59	48	380	255
9......	308	422	1,107	635	512	285	98	52	57	48	285	240
10......	272	368	930	551	494	315	95	57	48	48	530	240
11......	214	295	897	440	434	600	90	75	50	52	999	217
12......	178	285	753	1,053	368	705	80	68	39	48	621	197
13......	165	310	558	600	335	551	66	57	78	46	446	157
14......	160	295	530	530	295	452	61	52	115	39	386	157
15......	133	285	476	488	270	368	61	48	80	41	335	140
16......	150	255	446	440	265	628	68	50	63	39	325	140
17......	143	494	416	410	225	857	61	48	48	43	330	122
18......	133	691	416	1,887	235	1,775	59	39	43	41	285	93
19......	410	600	404	2,450	217	1,323	59	61	57	39	235	80
20......	365	600	464	2,050	185	1,080	57	52	48	43	193	80
21......	640	1,305	990	1,170	205	649	57	52	41	39	193	45
22......	12,000	1,450	817	865	185	494	57	43	37	43	185	45
23......	2,450	801	850	691	181	428	57	41	35	61	181	25
24......	1,450	551	1,014	565	193	380	52	39	57	52	193	1,350
25......	1,080	446	1,690	1,323	193	315	50	43	52	52	201	769
26......	833	452	2,000	12,860	209	240	52	39	71	50	205	500
27......	691	1,850	1,278	2,800	235	250	48	43	61	66	181	440
28......	512	8,030	1,017	1,650	193	285	68	41	73	106	177	470
29......	446	......	990	1,215	142	250	61	41	66	98	177	470
30......	350	......	1,251	1,017	165	217	59	39	61	95	177	1,950
31......	350	......	1,340	......	118	......	57	39	......	85	......	621
Mean...	796	802	1,312	1,394	376	499	80	49	56	53	311	337

Monthly Discharge of Schoharie Creek at Prattsville, N. Y.
[Drainage area, 240 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1909.					
January..........................	2,675	145	628	2.617	3.021
February..........................	6,500	428	1,220	5.083	5.290
March..........................	2,725	118	771	3.212	3.701
April..........................	6,340	380	1,045	4.354	4.853
May..........................	1,520	250	674	2.808	3.240
June..........................	990	106	291	1.212	1.350
July..........................	118	19	51	0.212	0.244
August..........................	181	10	37	0.154	0.178
September..........................	106	8	27	0.112	0.125
October..........................	43	23	30	0.125	0.144
November..........................	43	19	28	0.117	0.130
December..........................	440	10	91	0.379	0.437
The year..........................	6,500	8	408	1.700	22.713
1910.					
January..........................	12,000	43	796	3.317	3.828
February..........................	8,030	255	802	3.341	3.478
March..........................	5,020	404	1,312	5.467	6.306
April..........................	12,860	410	1,394	5.808	6.482
May..........................	999	118	376	1.567	1.810
June..........................	1,775	217	499	2.079	2.321
July..........................	161	48	80	0.333	0.384
August..........................	75	39	49	0.204	0.235
September..........................	115	31	56	0.233	0.260
October..........................	106	39	53	0.221	0.255
November..........................	999	66	311	1.296	1.450
December..........................	1,950	25	337	1.404	1.614
The year..........................	12,860	25	497	2.071	28.423

EAST CANADA CREEK.

EAST CANADA CREEK AT DOLGEVILLE, N. Y.

A gaging station on this stream was established for the U. S. Board of Engineers on Deep Waterways in 1898. It was maintained by the U. S. Geological Survey in coöperation with this Department from 1900 to June, 1907, inclusive, when it was taken over by this Department.

Observations are taken at High Falls, near Dolgeville, about 7 miles from the outlet of the stream. The gaging station is located at the dam of the Herkimer County Light and Power Company. The dam is of rubble masonry, 19 feet high, and has a flat crest 6 feet wide and 190.25 feet long between abutments. The elevation of the up-stream edge of the crest is 1 foot below that of the lip. The impounded water is conducted to the power-house, 500 feet below the dam, through a wrought-iron flume, 10 feet in diameter.

Readings of the depth on the crest are taken from a vertical gage board attached to the bulkhead, 6 feet up-stream, twice each day by Godfrey Aman. The mean of the readings is used in computing the discharge. A record is also kept of the run of the water-wheels and the elevation of water in the tail-race. The record since January 1, 1903, has been computed from a discharge curve based on the United States Geological Survey experiments on a full-sized model of the dams, made at Cornell University. The flow through the turbines for this period has also been computed from current-meter measurements, made in the tail-race of the electric power-plant instead of from the manufacturer's rating tables for the water-wheels, as formerly. The turbines are of a special Victor cylinder-gate type. The two main wheels are each 36 inches in diameter, and their speed is controlled by Lombard governors. Beginning November 12, 1907, a pair of 36-inch Rodney Hunt turbines have also been in use. Owing to changing flash-board conditions, the record for 1909 is approximate only. During the winter the dam is more or less obstructed by ice at times. The reduction in flow is estimated.

Spruce creek, the principal tributary of East Canada creek enters 1 mile above Dolgeville, and drains an area of 50 square miles. Water is diverted from this creek and from Beaver creek, one of the tributaries, at Diamond Hill, and is carried to Little

Falls through a cast-iron conduit 9 miles long. The water-supply of Dolgeville is taken from Cole brook, a tributary of East Canada creek. No allowance for diversion of water-supply has been made in computing the run-off for East Canada creek.

Drainage Areas of East Canada Creek.
(From U. S. G. S. Topographic Maps.)

LIMITS.	AREA IN SQUARE MILES:			
	Place to place.	Sub total.	Branch total.	Total.
EAST CANADA CREEK.				
Above Oregon	40.13	....	....	40.13
Oregon to junction with North creek	10.42	....	....	50.55
North Creek.				
Source to junction with East Canada creek	18.60	....	18.60	69.15
EAST CANADA CREEK.				
Junction with North creek to junction with Trammel creek	8.63	....	....	77.78
Trammel Creek.				
Source to junction with East Canada creek	12.04	....	....	89.82
EAST CANADA CREEK.				
Junction with Trammel creek to junction with Ayers creek (Stratford)	0.20	....	....	90.02
Ayers Creek.				
Source to junction with East Canada creek	13.63	....	....	103.65
EAST CANADA CREEK.				
Junction with Ayers creek (Stratford) to Emmonsburg	8.05	....	....	111.70
Emmonsburg to junction with Big Sprite creek	15.68	....	....	127.38
Big Sprite Creek.				
Source to Stewart landing	40.90	....	....	....
Stewart landing to junction with East Canada creek	7.87	....	48.77	176.15
EAST CANADA CREEK.				
Junction with Big Sprite creek to junction with Middle Sprite creek	3.70	....	....	179.85
Middle Sprite Creek.				
Source to junction with East Canada creek	22.65	....	....	202.50
EAST CANADA CREEK.				
Junction with Middle Sprite creek to junction with Spruce creek	0.20	....	....	202.70
Spruce Creek.				
Source to dam at Diamond Hill	36.20	36.20	....	....
Dam at Diamond Hill to Salisbury	13.08	49.28	....	....
Salisbury to junction with East Canada creek	1.20	....	50.48	252.98
EAST CANADA CREEK.				
Junction with Spruce creek to lower bridge Dolgeville	0.60	....	....	253.48
Lower bridge, Dolgeville to High Falls	3.64	....	....	257.22
High falls to junction with Gillett creek	0.84	....	....	258.06
Gillett Creek.				
Source to junction with East Canada creek	10.92	....	....	268.98
EAST CANADA CREEK.				
Junction with Gillett creek to Ingham Mills	8.73	....	....	277.71
Ingham Mills to Beardslee falls	3.60	....	....	281.31
Beardslee falls to mouth	0.30	....	....	281.61

Mean Daily Discharge, Second-feet, of East Canada Creek at Dolgeville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	95	370	5,137	3,727	599	720	195	119	139	411	212	221
2......	175	412	4,574	3,043	796	568	161	116	95	175	219	191
3......	170	359	3,791	2,209	811	474	128	112	389	168	295	177
4......	195	314	2,834	3,384	1,457	499	123	161	612	226	416	166
5......	180	283	2,250	2,731	1,013	1,066	109	337	518	210	475	108
6......	200	159	1,851	1,735	778	2,200	140	309	427	194	480	143
7......	243	225	2,494	1,750	718	1,675	155	159	599	202	522	144
8......	227	279	2,258	1,401	645	1,328	162	165	459	216	397	144
9......	207	337	1,875	1,048	506	1,105	180	148	266	178	402	146
10......	227	338	927	837	497	614	104	189	247	234	653	139
11......	246	265	861	838	431	499	117	435	95	201	718	89
12......	199	243	923	750	400	411	119	452	116	169	561	132
13......	200	172	757	677	359	726	111	265	120	129	405	135
14......	435	267	898	709	307	554	112	182	121	123	418	150
15......	180	262	715	508	156	404	103	145	175	171	389	146
16......	165	260	653	441	369	402	138	207	117	104	320	137
17......	200	269	716	405	280	353	136	138	138	128	259	127
18......	227	227	668	665	371	484	113	160	105	157	255	129
19......	435	187	582	1,950	831	377	113	454	100	136	243	140
20......	461	122	654	1,700	694	374	120	539	105	149	215	148
21......	887	306	1,233	1,248	1,050	398	126	15	100	141	198	148
22......	1,511	455	1,299	908	611	371	133	95	71	154	261	132
23......	1,173	385	1,757	578	723	315	359	109	80	177	255	142
24......	1,435	436	2,054	558	1,353	227	430	113	95	227	228	214
25......	972	476	4,361	624	2,184	165	180	109	121	252	275	224
26......	351	341	4,084	1,865	1,794	209	226	255	632	282	257	214
27......	431	2,052	2,540	1,628	1,654	95	205	437	604	430	157	249
28......	434	4,658	2,870	1,354	951	233	234	471	997	748	200	253
29......	395	......	3,134	905	649	170	238	90	951	485	228	229
30......	225	......	3,718	707	367	195	426	75	711	362	181	492
31......	366	......	3,859	......	697	......	421	75	......	424	......	610
Mean...	414	516	2,140	1,363	776	574	181	214	310	238	336	188

Monthly Discharge of East Canada Creek at Dolgeville, N. Y.

[Drainage area, 256 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
January..........................	1,511	95	414	1.62	1.86
February..........................	4,658	122	516	2.02	2.10
March..........................	5,137	582	2,140	8.36	9.61
April..........................	3,727	405	1,363	5.32	5.96
May..........................	2,184	156	776	3.03	3.48
June..........................	2,200	95	574	2.24	2.51
July..........................	430	103	181	0.707	0.813
August..........................	539	15	214	0.836	0.961
September..........................	997	71	310	1.21	1.36
October..........................	748	104	238	0.930	1.07
November..........................	718	157	336	1.31	1.47
December..........................	610	89	188	0.734	0.844

WEST CANADA CREEK DRAINAGE BASIN.

DESCRIPTION OF BASIN.

West Canada creek rises in West Canada lakes, in southwest-central Hamilton county, and flows southwestward, then southeastward into the Mohawk at Herkimer, N. Y.

The drainage area is shown on the Utica, Little Falls, Remsen, Wilmurt, Old Forge and Canada lakes quadrangles, U. S. Geological Survey topographic map.

There are about fifty small lakes and a few undrained ponds in the watershed of the stream. Most of these are situated near the head waters and above the gaging station, the largest single water-surface being Honnedega lake, 1.4 square miles in extent. There is also a small amount of controllable storage, in reservoirs formed by three dams. Swamps and marshes are numerous in the region of the head waters, usually adjoining lakes and tributaries and having an extent of one-half square mile or less each.

Much of the region above Twin Rock is timber-covered. There are extensive sand areas in the central and upper drainage basins. The soil of the upper watershed is underlaid by granitic gneiss usually at or near the surface, excepting in alluvial valleys. From a point just above Twin Rock bridge and extending down stream beyond Trenton Falls, the underlying geological formation is Trenton limestone.

Compacted snow accumulates in the woodlands in winter, often to a depth of three or four feet, and representing an inch of water for each five or six inches of snow. This melts slowly, feeding the stream in March and April, which months may show a run-off greatly exceeding the precipitation.

*Drainage Area of West Canada Creek.**

DIVISIONS OF AREA.	AREA IN SQUARE MILES.		
	Place to place.	Sub-total.	Total.
West Canada creek lakes, source to outlet of Mud lake	18.05	......	18.05
West Canada creek, foot of lakes to Swanson dam	28.77	......	46.8
West Canada creek, Swanson dam to ¾ mile below Metcalf brook	46.82	......	93.
Honnedaga lake, above outlet	5.40	5.40	....
Honnedaga brook, foot of lake to mouth	11.9	17.30	....
Honnedaga lake and brook, total, source to mouth	......	17.30	110.94
West Canada creek, Honnedaga lake outlet to junction with south branch (Nobleboro)	30.46	......	141.40
South branch, West Canada creek, above Mountain House (Remonda)	34.40	34.40	....
South branch, West Canada creek, Mountain House to mouth at Nobleboro	19.25	53.65	....
South branch, West Canada creek, total, source to mouth	......	53.65	....
West Canada creek, total to Nobleboro, including south branch	......	......	195.0
West Canada creek, Nobleboro (junction n. and s. branches) to Wilmurt	2.58	......	....
West Canada creek, total above bridge at Wilmurt	......	......	197.63
Fourmile brook, total, source to mouth	......	26.17	....
West Canada creek, total at Wilmurt, including Fourmile brook	......	......	223.80
West Canada creek, Wilmurt to mouth of Black creek	36.92	......	....
West Canada creek, total to mouth of Black creek	......	......	260.72
Black creek, source through Hall Vly	8.4	8.4	....
Black creek, Hall Vly to Bennett's mill (first bridge above Gray)	16.3	24.7	....
Black creek, Bennett's mill to Gray	4.5	29.2	....
Black creek, Gray to first bridge below Gray	3.0	32.20	....
Mill creek source through Cranberry lake and swamp	11.0	......	....
Mill creek, foot of Cranberry lake to junction N. Branch	6.2	17.20	....
Mill creek, total, source to mouth	......	17.20	....
North branch, Black creek, above contour 1,520 (Bull Hill road)	6.8	......	....
North branch, Black creek, Bull Hill road to junction Mill creek	4.0	10.8	....
North branch, Black creek, junction, Mill creek to mouth	0.85	11.65	....
North branch, Black creek, total to junction with Black creek	......	20.85	....
Black creek, total to first bridge below Gray	......	61.05	....
Black creek, first bridge below Gray to Mounts creek	0.17	61.22	....
Mounts creek, above Gray-Wilmurt road (Radley)	13.25	......	....
Mounts creek, Radley to mouth	2.10	......	....
Mounts creek, total, source to mouth	......	15.35	....
Black creek, mouth of Mounts creek to second bridge below Gray	1.55	......	....
Black creek, total to second bridge below Gray	......	78.12	....
Black creek, second bridge below Gray to third bridge	5.65	83.77	....
Black creek, third bridge below Gray to fourth bridge	12.35	96.12	....
Black creek, fourth bridge below Gray to fifth bridge (Pardeville)	4.0	100.12	....
Black creek, Pardeville to Grant	1.95	102.07	....
Black creek, Grant to mouth	1.15	103.22	....
Black creek, total, source to mouth	......	103.22	....
West Canada creek, total to mouth of and including Black creek	......	......	363.94
West Canada creek, mouth of Black creek to Twin Rock bridge	0.5	......	....
West Canada creek, total to Twin Rock bridge	......	......	364.44
West Canada creek, Twin Rock bridge to Hinckley dam	8.5	......	372.94
West Canada creek, Hinckley dam to Prospect	2.0	......	374.94
West Canada creek, Prospect to Trenton Falls	0.9	......	375.84
West Canada creek, Trenton Falls to Steuben creek	6.2	......	382.04
Steuben creek, total, source to mouth	52.3	......	434.34
West Canada creek, Steuben creek to Poland (first bridge below)	35.8	......	470.14
West Canada creek, Poland to Newport	10.0	......	480.14
West Canada creek, Newport to Middleville	47.2	......	527.34
West Canada creek, Middleville to Kast bridge	47.5	......	574.84
West Canada creek, Kast bridge to mouth	8.8	......	583.64
West Canada creek, total, source to mouth	......	......	583.64

* Taken from U. S. Geological Survey topographic maps.

WEST CANADA CREEK AT KAST BRIDGE, NEAR HERKIMER, N. Y.

This gaging station, which is located on West Canada creek about four miles from its junction with the Mohawk river, was established May 15, 1905, by Robert E. Horton, hydrographer, U. S. Geological Survey. The station has since been maintained by this Department.

The gage is of the weight-and-reel type and is placed in a box secured to the north railing of bridge at first panel point from east abutment. The readings are taken by measuring down from a scale in the box to the water-surface by means of an iron weight suspended by graduated tape, which is attached to the reel. The scale in box is one foot long, graduated to tenths and hundredths, with its zero at elevation 464.04. The end of weight used to locate the water-surface is 49.80 feet from zero of tape, which is graduated to feet. The elevation of bottom of weight, when zero of tape is opposite zero of scale, is, therefore, 414.24. The elevation of bench-mark on north end of bridge-seat of right-hand abutment is 458.02.

Observations are taken twice daily by Lloyd Kast.

Discharge measurements are made from the down-stream side of the bridge, to which the gage tape is attached. The initial point for soundings is the top face of the left abutment, down-stream side. The drainage area at this point is 574 square miles, or 58 per cent greater than at Twin Rock bridge.

Current-meter Discharge Measurements of West Canada Creek at Kast Bridge, near Herkimer, N. Y.

DATE.	Hydrographer.	GAGE READING. Beginning.	Ending.	Mean.	Meter No.	Lateral interval.	Sub-mergence depth.	Area flowing.	Total area.	Total width.	Computed discharge.	Velocity correction factor.	Corrected discharge.
						Feet.		Square feet.	Square feet.	Feet.	Second-feet.		Second-feet.
1910.													
Feb. 12	Clark & Robbins	28.58	28.58	28.58	462	5	6/10	....	351.20	175	588.19	....	....
March 3	Patchke & Robbins	32.70	32.55	32.62	213	10	1 Ft.	1,132.9	1,132.9	195.5	9,198.15	0.89	8,186.35
March 4	Patchke & Robbins	31.80	31.80	31.80	213	10	1 Ft.	971.30	971.30	195.8	6,843.66	0.89	6,090.86
Aug. 9	Barrett & Patchke	28.82	28.78	28.80	462	5	6/10	....	392.46	185	753.39	....	....
Aug. 16	Clark & Button	28.68	28.69	28.68	462	5	6/10	....	370.7	185	608.86	....	....

Mean Daily Discharge, Second-feet, of West Canada Creek at Kast Bridge, near Herkimer, N. Y

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	a	643	23,504	9,602	*1,299	1,630	394	456	304	1,630	942	767
2......	a	628	16,320	6,960	1,324	797	351	437	257	*1,146	942	708
3......	a	643	10,190	*5,092	1,665	1,120	*262	328	380	916	993	672
4......	a	651	6,790	3,796	3,265	1,044	276	351	*433	694	1,172	*672
5......	a	621	5,310	3,914	3,147	*840	323	2,832	636	614	1,910	418
6......	a	*456	*4,440	3,088	1,980	3,265	309	1,665	942	680	*1,770	428
7......	a	418	8,178	4,091	1,274	5,310	262	*1,350	1,146	1,044	1,525	418
8......	a	518	5,382	2,970	*1,044	3,383	342	1,044	891	942	1,222	475
9......	a	628	3,798	2,188	1,095	2,015	380	760	621	*723	1,172	489
10......	a	658	2,694	*1,385	1,095	1,630	*314	614	465	687	2,326	418
11......	a	562	1,980	1,299	993	1,945	446	2,234	*414	680	3,796	*475
12......	a	465	1,945	1,980	891	*2,326	562	2,326	418	636	2,188	446
13......	a	*518	*1,700	1,350	789	2,050	409	1,299	347	577	*1,700	614
14......	a	621	1,945	891	840	1,455	243	*774	437	526	1,197	614
15......	a	562	1,350	708	*774	1,070	267	672	404	489	1,248	672
16......	a	591	1,197	916	614	1,172	285	577	342	*504	1,044	465
17......	a	687	1,095	*1,146	518	1,044	*276	482	257	470	942	533
18......	a	636	993	1,095	723	1,248	351	446	*299	451	811	*651
19......	a	643	1,070	4,032	1,700	*2,050	304	591	123	409	840	541
20......	6,790	*591	*2,326	4,032	1,525	1,665	227	562	267	636	*811	694
21......	7,780	526	2,602	3,029	2,694	1,095	234	*465	252	511	680	636
22......	8,665	840	2,970	1,980	*2,510	804	285	418	248	470	811	606
23......	*6,450	840	3,442	1,455	1,560	745	280	399	323	*599	797	614
24......	4,295	891	4,222	*1,274	1,299	614	*390	314	366	789	891	804
25......	2,740	804	6,620	993	3,560	497	404	351	*404	789	1,120	*916
26......	2,694	774	8,178	2,694	4,585	*409	285	437	1,805	1,018	1,070	1,070
27......	1,770	*993	*6,195	4,440	2,832	418	276	423	1,420	1,095	*826	1,146
28......	1,299	17,280	4,802	2,970	2,234	404	1,120	*390	6,025	1,805	723	1,197
29......	1,120	......	6,365	1,910	*1,420	323	1,350	361	5,165	1,700	789	1,197
30......	*840	......	8,080	1,735	1,770	351	723	257	2,372	*1,299	826	2,510
31......	968	......	8,958	......	1,910	......	*643	333	......	1,172	......	1,630
Mean...	3,696	1,239	5,311	2,767	1,707	1,424	406	772	759	829	1,236	758

* Sunday. *a* No record.

Monthly Discharge of West Canada Creek at Kast Bridge, near Herkimer, N. Y.

[Drainage area, 575 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
January *a*..........................	8,665	840	3,696	6.43	7.39
February..........................	17,280	418	1,239	2.15	2.24
March..........................	23,504	993	5,311	9.24	10.63
April..........................	9,602	708	2,767	4.81	5.39
May..........................	4,585	518	1,707	2.97	3.42
June..........................	5,310	323	1,424	2.48	2.78
July..........................	1,350	227	406	0.706	0.812
August..........................	2,832	257	772	1.34	1.54
September..........................	5,165	123	759	1.32	1.48
October..........................	1,805	409	829	1.44	1.66
November..........................	3,796	680	1,236	2.15	2.41
December..........................	2,510	418	758	1.32	1.52

a Anchor ice obstruction, January to March; record may be excessive.

WEST CANADA CREEK AT POLAND, N. Y.

A gaging station was established by this Department on West Canada creek at the first highway bridge below the village of Poland, July 3, 1908. The gage is of the weight-and-chain variety, contained in a box of standard form, which is fastened to the hand railing of the down-stream side of the bridge near the left-hand end. Length of chain from end of weight to copper rivet marker is 22.65 feet. The gage is read each morning and night by Harrison Fisher. Current-meter measurements obtained during 1908–1910 established a consistent rating curve for low stages of the stream. The accompanying discharge tables have been deduced by the use of this curve.

Mean Daily Gage Height, in Feet, of West Canada Creek at Poland, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	3.45	4.00	10.90	8.40	4.80	5.05	3.60	3.70	3.10	4.80	4.25	3.90
2......	3.45	4.05	9.80	8.00	4.75	4.85	3.45	3.60	3.20	4.60	4.20	3.80
3......	3.70	3.85	8.65	7.10	5.00	4.55	3.45	3.55	3.45	4.25	4.45	3.70
4......	3.60	4.00	7.55	6.50	6.30	4.25	3.40	4.30	4.20	4.05	4.55	3.70
5......	3.80	3.90	6.85	6.40	5.95	4.35	3.45	6.00	3.95	3.95	5.10	3.50
6......	3.90	3.70	6.40	6.85	5.10	6.10	3.35	5.10	4.25	4.15	5.05	3.75
7......	4.00	3.75	7.30	6.90	4.80	6.65	3.30	4.90	4.40	4.70	4.85	3.45
8	3.90	3.85	7.00	6.65	4.65	5.90	3.45	4.45	4.15	4.35	4.65	3.50
9......	4.05	3.85	6.25	5.80	4.55	5.55	3.60	4.20	3.85	4.15	4.55	3.60
10......	4.15	3.90	5.50	5.45	4.55	5.10	3.45	4.15	3.75	4.05	5.05	3.55
11......	4.05	3.80	5.15	5.40	4.40	5.25	3.90	5.80	3.45	4.05	6.10	3.65
12......	4.00	3.85	5.05	5.35	4.25	5.40	3.80	5.55	3.60	4.00	5.50	3.75
13......	4.00	3.60	4.85	5.05	4.25	5.25	3.55	4.95	3.55	4.00	4.70	3.80
14......	3.95	3.85	4.95	4.15	4.40	4.70	3.20	4.45	3.60	3.80	4.65	3.65
15......	3.85	3.80	4.65	4.20	4.10	4.35	3.40	3.95	3.55	3.75	4.55	3.70
16......	3.75	3.80	4.45	4.50	3.80	4.35	3.35	3.80	3.45	3.65	4.40	3.75
17......	4.00	3.85	4.30	4.35	3.70	4.25	3.45	3.70	3.35	3.70	4.25	3.80
18......	4.20	3.85	4.25	4.35	4.15	4.95	3.40	3.80	3.30	3.70	4.05	3.50
19......	4.60	3.85	4.25	6.95	5.45	5.40	3.40	3.85	3.20	3.60	4.15	3.70
20......	5.15	3.80	5.00	6.90	5.15	4.90	3.30	3.80	3.30	3.95	4.00	3.70
21......	5.50	3.95	5.25	6.30	5.75	4.30	3.35	3.80	3.25	3.80	3.85	3.55
22......	6.80	4.15	5.80	5.75	5.50	4.15	3.35	3.60	3.30	3.75	4.00	3.60
23......	6.95	4.15	6.05	4.80	4.90	3.95	3.30	3.50	3.25	3.95	4.00	3.55
24......	6.20	4.35	6.45	4.55	4.75	3.80	3.55	3.45	3.40	4.05	4.10	3.60
25......	5.70	4.20	7.45	4.85	5.90	3.65	3.65	3.60	3.50	4.10	4.25	3.85
26......	5.40	4.30	8.20	5.35	6.65	3.55	3.45	3.70	5.20	4.40	4.10	4.05
27......	4.95	4.50	6.90	6.85	5.80	3.65	3.30	3.55	4.75	4.55	4.00	4.05
28......	4.70	8.40	6.90	6.50	5.40	3.60	4.85	3.60	7.77	4.25	3.95	4.05
29......	4.45	......	7.60	5.30	4.85	3.65	4.60	3.30	6.75	5.05	4.00	3.95
30......	4.20	......	8.10	5.10	5.35	3.60	4.15	3.15	5.50	4.70	3.95	4.75
31......	4.20	......	8.50	......	5.25	......	3.95	3.35	......	4.45	......	4.85

Current-meter Discharge Measurements of West Canada Creek at Poland, N. Y.

DATE.	Hydrographer.	GAGE READING.			Meter No.	Lateral interval.	Submergence depth.	Area flowing.	Total area.	Total width.	Computed discharge.	Velocity correction factor.	Corrected discharge.
		Beginning.	Ending.	Mean.									
						Feet.		*Square feet.*	*Square feet.*	*Feet.*	*Second-feet.*		*Second-feet.*
1910.													
Feb. 11	Clark & Robbins........	3.82	3.75	3.78	462	5	6/10	....	416.47	163.3	440.10	....	....
March 2	Patchke & Robbins........	9.60	9.55	9.58	213	10	1 Ft.	1,349.97	1,349.97	171	9,986.07	0.89	8,887.60
March 3	Patchke & Robbins........	8.77	8.74	8.76	213	10	1 Ft.	1,220.21	1,220.21	170	8,036.84	0.89	7,152.79
March 3	Patchke & Robbins........	8.70	8.68	8.69	213	10	1 Ft	1,208.58	1,208.58	170	7,776.63	0.89	6,921.24
March 3	Patchke & Robbins........	8.67	8.65	8.66	213	10	1 Ft.	1,203.02	1,203.02	170	7,632.00	0.89	6,792.80
Aug. 10	Barrett & Patchke.....	3.96	3.96	3.96	462	5	6/10	....	445.10	168	622.58	....	....

Rating Table for West Canada Creek at Poland, N. Y.

Ft. / Decimals.	0	1	2	3	4	5	6	7	8	9	10
				Sec.-ft.	*Sec. f.*	*Sec.-ft.*	*Sec.-ft.*	*Sec.-ft.*	*Sec.-ft.*	*Sec.-ft.*	*Sec.-ft.*
0........	....	....	....	140	620	1,390	2,740	4,400	6,440	8,625	10,875
.05........	....	....	....	160	652	1,444	2,822	4,488	6,532	8,738	....
.10........	....	....	....	180	684	1,498	2,904	4,575	6,625	8,850	....
.15........	....	....	....	200	712	1,552	2,986	4,675	6,728	8,962	....
.20........	....	....	....	220	748	1,606	3,068	4,775	6,830	9,075	....
.25........	....	....	....	240	780	1,660	3,150	4,875	6,935	9,188	....
.30........	....	....	....	263	814	1,725	3,235	4,975	7,040	9,300	....
.35........	....	....	....	286	848	1,790	3,320	5,032	7,145	9,418	....
.40........	....	....	....	309	882	1,855	3,405	5,190	7,250	9,535	....
.45........	....	....	....	332	916	1,820	3,490	5,295	7,350	9,655	....
.50........	....	....	....	355	950	1,990	3,575	5,400	7,450	9,775	....
.55........	....	....	....	380	991	2,062	3,650	5,500	7,555	9,888	....
.60........	....	....	....	405	1,032	2,134	3,725	5,600	7,660	10,000	....
.65........	....	....	....	430	1,073	2,206	3,806	5,705	7,768	10,112	....
.70........	....	....	....	455	1,114	2,278	3,887	5,810	7,875	10,225	....
.75........	....	....	....	480	1,155	2,350	3,968	5,910	8,000	10,338	....
.80........	....	....	....	508	1,202	2,428	4,050	6,010	8,125	10,450	....
.85........	....	....	....	536	1,249	2,506	4,138	6,118	8,250	10,562	....
.90........	....	....	....	564	1,296	2,584	4,225	6,225	8,375	10,675	....
.95........	....	....	....	592	1,343	2,662	4,312	6,332	8,500	10,775	....
1.00........	....	....	....	620	1,390	2,740	4,400	6,440	8,625	10,875	....

Mean Daily Discharge, Second-feet, of West Canada Creek at Poland, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	332	620	......	7,250	*1,202	1,444	405	455	180	1,202	780	564
2	*332	652	10,450	6,440	1,155	1,249	332	405	220	*1,032	748	508
3	455	536	7,768	*4,575	1,390	991	*332	380	332	780	916	455
4	405	620	5,500	3,575	3,235	780	309	814	*748	652	991	*455
5	508	564	4,138	3,405	2,662	*848	332	2,740	592	592	1,498	355
6	564	*455	*3,405	4,138	1,498	2,904	286	1,498	780	712	*1,444	480
7	620	480	4,975	4,225	1,202	3,806	263	*1,296	882	1,114	1,249	332
8	564	536	4,400	3,806	*1,073	2,584	332	916	712	848	1,073	355
9	*652	536	3,150	2,428	991	2,062	405	748	536	*712	991	405
10	712	564	1,990	*1,820	991	1,498	*332	712	480	652	1,444	380
11	652	508	1,552	1,855	882	1,660	564	2,428	*332	652	2,904	*430
12	620	536	1,444	1,790	780	*1,855	508	2,062	405	620	1,990	480
13	620	*405	*1,249	1,444	780	1,660	380	1,343	380	620	*1,114	508
14	592	536	1,343	712	882	1,114	220	*916	405	508	1,073	430
15	536	508	1,073	748	*684	848	309	592	380	480	991	455
16	*480	508	916	950	508	848	286	508	332	*430	882	480
17	620	536	814	*848	455	780	*332	455	286	455	780	508
18	748	536	780	848	712	1,343	309	508	*263	455	652	*355
19	1,032	536	780	4,312	1,820	*1,855	309	536	220	405	712	455
20	1,552	*508	*1,390	4,225	1,552	1,296	263	508	263	592	*620	455
21	1,990	592	1,660	3,235	2,350	814	286	*508	240	508	536	380
22	4,050	712	2,428	2,350	*1,990	712	286	405	263	480	620	405
23	*4,312	712	2,822	1,202	1,296	592	263	355	240	*592	620	380
24	3,068	848	3,490	*991	1,155	508	*380	332	309	652	684	405
25	2,278	748	5,295	1,249	2,584	430	430	405	*355	684	780	*536
26	1,855	814	6,830	1,790	3,806	*380	332	455	1,606	882	684	652
27	1,343	*950	*4,225	4,138	2,428	430	263	380	1,155	991	*620	652
28	1,114	7,250	4,225	3,575	1,855	405	1,249	*405	5,810	780	592	652
29	916	......	5,600	1,725	*1,249	430	1,032	263	3,968	1,444	620	592
30	*748	......	6,625	1,498	1,790	405	712	200	1,990	*1,114	592	1,155
31	748	......	7,450	......	1,660	......	*592	286	......	916	......	1,249
Mean	1,129.6	832	3,592	2,705	1,504	1,218	408	768	819	728	973	513

* Sunday.

Monthly Discharge of West Canada Creek at Poland, N. Y.

[Drainage area, 470 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
January	4,312	332	1,130	2.40	2.76
February	7,250	405	832	1.77	1.84
March	10,450	780	3,592	7.64	8.79
April	7,250	712	2,705	5.76	6.45
May	3,806	455	1,504	3.20	3.54
June	3,806	380	1,218	2.59	2.90
July	1,249	263	408	0.88	1.01
August	2,740	200	768	1.63	1.87
September	5,810	180	819	1.74	1.95
October	1,444	405	728	1.55	1.78
November	2,904	536	973	2.07	2.32
December	1,249	332	513	1.09	1.25

WEST CANADA CREEK AT TRENTON FALLS, N. Y.

This gaging station, which is located at the dam of the Utica Gas and Electric Co., was established October 17, 1905, by C. A. Poole. The gage board is secured to face of dam in a vertical position and is placed above the water-surface, the readings being taken by means of chain and plumb-bob passing on pulley over top of gage. The observations are taken by placing plumb-bob at water-surface and reading the gage at a point marked on chain ten feet above plumb-bob. The elevation of zero of gage is 1,009.56, to which all readings are added. The gage is graduated in feet and inches and is read twice each day by C. W. Young.

The dam is of concrete with masonry coping and has a spillway 97.9 feet long. Another spillway or by-pass two feet lower than crest or main spillway allows the water to pass through a rock channel on east side of dam. The crest of this lower spillway is 163.4 feet long at an elevation of 1,007.12. The discharge over the two spillways has been calculated by means of the weir formula, using coëfficients derived from the United States Geological Survey experiments.

The discharge diverted by the Power Company has been computed from diagrams expressing the flow as a function of the kilowatts used. These diagrams were made from tests made by the Power Company to determine the discharging capacity of the turbines, which are of a special design. These tests were made by computing the discharge over weirs placed in the tail-race.

A daily record is kept of the total kilowatts used in twenty-four hours, also the number of hours every day each turbine runs, there being four turbines in all.

The mean discharge has been calculated from each observation taken at the gage, thereby giving a mean for twelve hours, and the maximum and minimum discharges given in the accompanying table are, therefore, means for twelve hours and do not represent the highest or lowest flow of short duration.

The pondage above the Trenton Falls dam is very limited and the operation of the generators during low water has to be adjusted according to the conditions of inflow. The inflow is controlled by pondage above Hinckley dam. Owing to irregularity of operation during low water, the Trenton Falls record is considered approximate only, for the low-water period.

Owing to the drawing down of the pond above the Trenton Falls dam, the average elevation of the water-surface in the pond is deduced from two daily readings, roughly approximate only. The pond level fluctuates often as much as 10 feet during 24 hours in the low-water season. In connection with the calculated discharge at Trenton Falls it may be stated that there are a variety of conditions which tend to make the results of calculations of discharge for that station somewhat too small, especially during low-water periods.

The drainage area at the point of gaging is 375.8 square miles.

Mean Daily Discharge, Second-feet, of West Canada Creek at Trenton Falls, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1......	363	629	1,065	2,411	3,344	436	185	*129	141	242	280	500
2......	419	493	971	2,537	*4,279	371	203	243	144	267	293	446
3......	*363	416	806	2,961	3,424	307	164	165	147	*506	291	482
4......	324	376	758	*4,267	2,431	277	*459	165	150	257	293	431
5......	407	373	622	3,589	2,472	557	341	161	*121	239	315	*409
6......	2,285	673	605	4,223	3,358	*1,285	261	149	401	181	305	346
7......	3,132	*2,075	*632	7,404	3,693	857	226	147	279	184	*297	306
8......	2,111	1,997	470	9,454	4,476	672	195	*68	252	190	280	305
9......	1,862	1,414	423	5,401	*3,788	528	173	197	188	269	366	277
10......	*1,747	1,249	495	3,273	4,322	524	133	199	186	*107	366	215
11......	1,052	1,145	855	*3,997	6,693	914	*642	131	117	193	370	230
12......	797	1,143	900	1,514	4,995	869	234	134	*99	181	283	*507
13......	895	1,029	782	2,480	2,903	*683	181	130	201	164	275	299
14......	443	*866	*798	10,137	1,991	734	163	119	181	181	*542	283
15......	590	718	620	9,734	1,808	653	162	*129	176	197	293	283
16......	392	814	599	6,263	*2,307	526	142	136	156	161	283	304
17......	*759	1,371	519	4,978	1,876	435	159	225	154	*93	254	307
18......	299	1,359	469	*5,452	1,571	751	*105	366	131	538	779	293
19......	329	1,182	391	5,589	1,213	823	236	246	*82	426	535	*424
20......	326	2,008	1,876	8,457	987	*699	201	267	182	283	461	276
21......	326	*4,445	*2,100	5,293	797	508	187	218	159	279	*496	294
22......	346	3,409	1,419	4,232	784	410	172	*205	153	644	677	283
23......	364	2,458	955	5,410	*748	339	218	249	142	1,121	1,506	274
24......	*1,175	2,054	1,220	3,684	620	306	396	195	137	*946	1,508	268
25......	3,129	4,018	2,178	*3,999	529	280	*664	161	192	680	1,110	166
26......	2,910	3,590	2,770	2,610	454	308	564	171	*	521	827	*500
27......	2,590	2,583	2,492	4,048	414	*334	301	131	154	471	652	278
28......	1,319	*1,714	*2,927	3,968	872	256	258	123	163	365	*600	256
29......	960	......	2,429	3,782	791	236	256	*98	149	293	594	238
30......	949	......	2,367	2,738	*703	212	259	158	194	282	615	234
31......	*927	......	2,299	......	581	......	209	151	......	*418	......	213
Mean...	1,093	1,628	1,220	4,796	2,230	536	260	173	164	351	535	320

* Sunday.

Mean Daily Discharge, Second-feet, of West Canada Creek at Trenton Falls, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	169	390	9,992	3,942	1,109	1,219	272	359	187	770	660	379
2.....	724	405	7,741	2,335	1,042	1,030	233	270	207	869	580	301
3.....	269	437	5,294	1,944	1,189	851	250	275	228	471	790	273
4.....	248	392	3,479	1,571	2,436	688	298	816	727	421	828	296
5.....	233	403	2,592	892	2,437	816	260	2,278	629	394	1,046	290
6.....	217	329	2,254	1,618	1,389	2,168	187	1,443	641	393	1,262	265
7.....	250	265	2,533	1,202	1,139	3,056	191	1,284	895	536	1,037	196
8.....	284	294	2,751	1,494	987	2,303	263	835	652	555	868	247
9.....	412	361	1,903	2,050	836	1,532	247	607	495	593	827	260
10.....	246	375	1,364	1,953	823	1,252	325	609	346	415	868	240
11.....	258	285	988	1,525	761	1,435	564	2,091	349	396	2,104	901
12.....	273	359	854	1,616	731	1,579	292	1,797	269	371	1,491	252
13.....	243	543	945	1,305	615	1,326	265	1,343	266	342	1,076	282
14.....	233	290	845	889	671	987	227	827	262	317	824	252
15.....	241	283	688	707	583	782	239	547	255	286	794	280
16.....	127	302	605	893	451	886	202	411	223	303	723	251
17.....	241	317	565	1,072	397	725	415	287	218	272	619	265
18.....	267	351	473	1,045	513	1,169	250	287	41	293	644	161
19.....	432	307	461	3,790	1,353	1,803	222	360	201	404	562	260
20.....	1,426	351	391	2,930	1,136	1,116	198	458	185	507	520	264
21.....	1,756	376	1,049	2,309	1,482	792	198	470	181	409	345	234
22.....	2,845	565	1,386	1,538	1,682	610	212	283	201	293	511	256
23.....	3,692	950	1,565	1,167	1,159	485	317	204	267	516	478	218
24.....	2,239	726	1,929	1,066	1,059	425	408	259	249	605	501	240
25.....	1,868	848	2,977	773	1,830	402	241	337	163	543	577	2,104
26.....	1,218	703	4,857	1,912	2,702	400	222	289	1,379	835	459	772
27.....	1,052	1,457	3,017	3,529	2,180	422	231	345	981	830	542	479
28.....	862	7,230	2,425	2,247	1,419	240	1,436	337	4,051	1,550	347	394
29.....	739	......	3,762	1,484	1,093	285	975	262	3,003	1,253	486	291
30.....	506	......	4,562	1,410	1,163	286	693	239	1,375	1,135	453	890
31.....	543	......	5,344	......	1,381	......	589	204	......	827	......	1,415
Mean...	778	710	2,567	1,707	1,218	1,032	352	658	638	571	761	426

Monthly Discharge of West Canada Creek at Trenton Falls, N. Y.

[Drainage area, 376 square miles]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1909.					
January	**3,132**	**299**	**1,093**	**2.91**	**3.35**
February	**4,445**	**373**	**1,628**	**4.34**	**4.51**
March	**2,927**	**391**	**1,220**	**3.25**	**3.74**
April	**10,137**	**2,411**	**4,796**	**12.76**	**14.29**
May	**6,693**	**414**	**2,230**	**5.94**	**6.65**
June	**1,285**	**212**	**536**	**1.43**	**1.60**
July	**642**	**105**	**260**	**0.67**	**0.77**
August	**366**	**68**	**173**	**0.46**	**0.53**
September	**401**	**82**	**164**	**0.44**	**0.49**
October	**1,121**	**93**	**351**	**0.93**	**1.07**
November	**1,508**	**254**	**535**	**1.42**	**1.59**
December	**507**	**166**	**320**	**0.85**	**0.95**
1910.					
January	**3,692**	**127**	**778**	**2.07**	**2.39**
February	**7,230**	**283**	**710**	**1.88**	**1.96**
March	**9,992**	**391**	**2,567**	**6.83**	**7.87**
April	**3,942**	**707**	**1,707**	**4.54**	**5.07**
May	**2,702**	**451**	**1,218**	**3.24**	**3.74**
June	**3,056**	**240**	**1,032**	**2.74**	**3.06**
July	**1,436**	**187**	**352**	**0.94**	**1.08**
August	**2,278**	**204**	**658**	**1.75**	**2.02**
September	**4,051**	**41**	**638**	**1.70**	**1.90**
October	**1,550**	**286**	**571**	**1.52**	**1.75**
November	**2,104**	**345**	**761**	**2.03**	**2.66**
December	**2,104**	**161**	**426**	**1.14**	**1.31**

WEST CANADA CREEK AT TWIN ROCK BRIDGE, NEAR GRANT, N. Y.

A current-meter gaging station was established at Twin Rock bridge, September 7, 1900, by Robert E. Horton, for the U. S. Geological Survey, by which it has since been maintained in co-operation with this Department. The bridge is 167.5 feet long between abutments, and consists of two spans. The bed is of gravel and cobble, and the entire flow passes underneath at all stages. In the winter the stream becomes completely ice-covered, requiring special discharge measurements. The gage is read each morning and evening by Frank McArthur.

The readings are taken from a gage of special design equipped with a phosphor-bronze tape, attached to the up-stream side of the bridge. When the stream is obstructed by logs, the discharge is determined from special measurements. During 1900 a series of low-water measurements was made by boat at a cross-section up-stream from the bridge.

The gaging section at Twin Rock bridge is affected at times by backwater from logs which are lodged in the stream, beginning near Hinckley mill-dam and extending up-stream nearly to the bridge, or sometimes above the bridge. During periods of log obstruction, as also in winter, when the stream is ice-covered and contains more or less needle ice, it is necessary to estimate the discharge from special current-meter measurements and rating curves. The accompanying tables show the actual readings of the gage, but owing to the complicated conditions it is not practical to publish rating tables. It is to be understood that there is not a uniform or constant relation between the gage height and discharge.

The drainage area at point of gaging is 364 square miles.

Mean Daily Gage Height, in Feet, of West Canada Creek at Twin Rock Bridge, near Grant, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	29.60	30.62	41.36	38.24	32.44	32.73	30.22	30.61	29.88	30.92	30.07	29.08
2.....	29.68	30.54	39.68	36.92	32.38	32.36	30.18	30.30	30.26	30.50	29.95	28.95
3.....	29.62	30.56	38.07	35.68	32.68	32.01	30.12	30.38	30.14	29.98	30.38	29.07
4.....	29.34	30.58	36.16	35.64	34.86	31.65	30.16	32.10	31.22	29.66	30.44	29.17
5.....	29.42	30.51	34.86	34.47	34.81	31.51	29.92	33.78	30.93	29.54	30.74	28.96
6.....	29.66	30.26	33.86	35.44	33.01	34.66	29.84	32.87	31.19	29.72	30.95	28.79
7.....	29.84	29.91	34.96	35.10	32.50	35.58	30.03	32.62	31.82	30.28	30.62	28.68
8.....	29.88	30.05	34.93	35.10	32.05	34.54	30.66	31.75	31.20	30.17	30.17	29.02
9.....	29.98	30.30	34.20	33.14	31.98	33.48	30.34	31.24	30.63	29.90	29.96	28.98
10.....	29.93	30.36	32.69	32.78	31.90	32.88	30.31	31.00	30.38	29.86	30.10	29.00
11.....	29.80	30.16	32.16	32.64	31.68	33.20	30.33	34.20	30.24	29.69	31.09	29.07
12.....	29.76	30.20	31.62	32.33	31.50	33.42	30.67	33.50	30.26	29.47	30.83	28.91
13.....	29.68	30.36	31.36	31.78	31.50	33.03	30.11	32.86	30.20	29.26	30.31	29.08
14.....	29.60	30.38	31.25	29.92	31.52	32.57	30.10	31.62	30.20	29.16	30.12	29.08
15.....	29.66	30.26	30.96	30.69	31.44	31.81	30.00	31.02	30.08	29.14	29.96	29.08
16.....	29.80	30.28	30.70	31.38	30.86	32.16	30.01	30.71	29.94	29.32	29.78	29.04
17.....	29.64	30.34	30.74	31.21	30.64	31.67	30.36	30.52	29.78	29.21	29.60	29.04
18.....	29.80	30.38	30.64	31.74	31.04	32.82	30.16	30.37	29.80	29.05	29.46	29.05
19.....	30.54	30.46	30.39	35.97	33.06	33.42	29.94	30.82	29.74	29.60	29.40	29.10
20.....	31.53	30.42	30.86	35.28	32.51	32.62	29.79	30.79	29.71	29.55	29.50	29.02
21.....	32.02	30.62	32.10	33.88	33.36	31.86	29.78	30.45	29.68	29.28	29.22	29.07
22.....	33.36	31.07	32.62	32.42	33.58	31.38	29.99	30.20	30.20	29.00	29.39	28.94
23.....	34.88	31.30	33.10	31.86	32.64	31.05	30.58	30.14	30.20	29.85	29.30	29.07
24.....	33.93	31.29	33.82	31.40	32.28	30.78	30.35	30.42	29.90	29.92	29.34	29.34
25.....	33.34	31.15	35.10	31.00	33.85	30.58	30.18	30.55	30.46	29.74	29.40	29.52
26.....	32.30	30.99	37.09	33.43	35.17	30.51	30.20	30.51	32.34	30.43	29.32	29.65
27.....	31.98	31.34	35.23	36.02	34.28	30.36	30.26	30.40	30.46	30.38	29.30	29.53
28.....	31.58	37.91	34.72	34.40	33.48	30.44	33.54	30.28	35.08	31.65	29.06	29.40
29.....	31.22	......	36.33	33.28	33.51	30.58	31.90	29.96	33.97	31.23	29.35	29.30
30.....	30.91	......	37.26	32.96	32.53	30.44	31.34	29.84	31.86	30.79	29.18	30.14
31.....	30.44	......	37.88	......	33.16	......	31.10	29.64	......	30.42	......	30.66

Current-meter Discharge Measurements of West Canada Creek at Twin Rock Bridge, near Grant, N. Y.

DATE.	Hydrographer.	GAGE READING.			Meter No.	Lateral interval.	Sub-mergence depth.	Area flowing.	Total area.	Total width.	Computed discharge.	Velocity correction factor.	Corrected discharge.
		Beginning.	Ending.	Mean.									
1910.						*Feet.*		*Square feet.*	*Square feet.*	*Feet.*	*Second-feet.*		***Second-feet.***
April 20	Patchke & Button	36.24	36.00	36.12	559	10	0.6	1,533	1,533	167.5	3,928	0.93	3,653
May 5	Clark & Button..	35.11	35.01	35.06	559	5	0.6	1,368	1,368	167.5	2,798	0.93	2,602
May 13	H. V. Button....	31.30	31.30	31.30	559	5	0.6	765	765	167.5	679	0.93	632
May 16	H. V. Button....	30.82	30.82	30.82	550	10	0.6	689	689	167.5	532	0.93	494
May 20	H. V. Button....	32.55	32.49	32.52	559	5	0.6	960	960	167.5	1,188	0.93	1,105
May 24	H. V. Button....	32.67	32.67	32.67	559	5	0.6	984	984	167.5	1,300	0.93	1,209
June 16	H. V. Button....	31.79	31.79	31.79	559	5	0.6	844	844	167.5	835	0.93	776
Aug. 11	Barrett & Patchke	34.30	34.26	34.28	462	5	0.6	1,241	1,241	167.5	2,250	0.93	2,092
Aug. 12	Barrett & Patchke	33.64	33.62	33.63	462	5	0.6	1,138	1,138	167.5	1,734	0.93	1,613
Aug. 17	Clark & Button..	30.55	30.53	30.54	462	5	0.6	614	644	167.5	381	0.93	355
Aug. 31	A. R. Patchke....	29.62	20.63	29.62	559	5	0.6	497	497	167.5	238	0.93	222

Mean Daily Discharge, Second-feet, of West Canada Creek at Twin Rock, near Grant, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.
1910.									
1	517	672	*a*	*a*	1,066	1,188	273	383	181
2	544	1,641	*a*	*a*	1,042	1,034	262	294	284
3	524	649	*a*	3,200	1,166	894	246	316	251
4	429	656	*a*	3,160	2,448	757	257	930	595
5	456	555	*a*	2,146	2,408	704	191	1,695	491
6	469	469	*a*	2,970	1,304	2,288	170	1,248	584
7	531	350	*a*	2,650	1,090	3,102	220	1,139	822
8	544	398	2,571	2,650	910	2,198	399	799	588
9	580	483	2,100	1,361	882	1,525	305	603	390
10	562	503	1,244	1,211	852	1,252	297	516	316
11	517	435	987	1,148	768	1,390	302	1,954	278
12	503	449	748	1,022	700	1,494	402	1,535	284
13	476	503	649	806	700	1,313	243	1,244	268
14	449	510	2,321	191	708	1,118	240	746	268
15	469	469	2,041	409	677	818	212	523	234
16	449	408	1,794	655	466	954	215	415	196
17	395	429	1,830	592	393	765	311	356	155
18	449	442	1,744	791	530	1,228	257	313	160
19	717	469	1,534	3,500	1,325	1,494	196	453	145
20	1,164	456	1,945	2,810	1,094	1,139	157	443	137
21	1,415	524	3,235	1,752	1,465	837	155	336	130
22	2,198	691	3,833	1,058	1,579	655	209	268	268
23	3,228	783	1,342	837	1,148	534	374	251	268
24	2,571	779	1,718	662	1,002	439	308	328	186
25	2,184	721	2,650	516	1,735	374	262	365	339
26	1,457	584	*a*	1,499	2,706	353	268	353	1,026
27	1,291	717	2,760	3,552	2,015	311	284	322	339
28	1,092	*a*	2,336	2,090	1,525	333	1,557	289	2,632
29	924	....	3,890	1,427	1,540	374	852	202	1,810
30	787	....	....	1,284	1,102	333	640	170	837
31	603	....	....	....	1,371	....	552	118	....
Mean	919	583	2,060	1,641	1,217	1,040	342	610	482

a Gage height beyond limits of rating curve.

Monthly Discharge of West Canada Creek at Twin Rock Bridge, near Grant, N. Y.
[Drainage area, 364 square miles].

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
January	3,228	395	919	2.525	2.91
February	1,641	350	583	1.602	1.67
March	3,890	649	2,060	5.659	6.52
April	3,552	191	1,641	4.508	5.03
May	2,706	393	1,217	3.343	3.85
June	3,102	311	1,040	2.857	3.19
July	1,557	155	342	0.940	1.08
August	1,954	118	610	1.676	1.93
September	2,632	130	482	1.324	1.47

WEST CANADA CREEK AT WILMURT, N. Y.

A gaging station was established at the highway bridge crossing West Canada creek at Wilmurt, on June 28, 1909, by this Department. This gage consists of an enameled steel scale, reading in feet and tenths from zero to 10 feet. This is attached to planking on the right-hand side of the center pier on the down-stream side of the bridge. In addition a 5-foot section, reading from 10 feet to 15 feet, is attached to a telegraph pole near the Flansburgh residence. The cross-section of the stream at the location of the gage is not favorable for purposes of measurement in low water. It can be utilized at certain stages of the stream and low-water measurements can be obtained at a more favorable cross-section located a short distance down-stream. The observer is Glenn W. Flansburgh, by whom gage readings are taken at 7 A. M. and 4 P. M. each day. This gaging station can be reached only by driving a distance of several miles from Prospect or Hinckley. The drainage area at the gaging station is 224 square miles. The gage is located above the limit of backwater from the proposed Hinckley reservoir, which is being constructed in connection with the State Barge canal.

Mean Daily Elevation of Water-surface (Arbitrary Datum, 100.00) of West Canada Creek at Wilmurt, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	103.00	103.00	*a*	105.33	103.32	103.42	101.92	102.22	102.12	103.07	102.82	102.32
2.....	102.85	102.90	*a*	105.13	103.72	103.32	101.92	102.07	102.12	103.07	102.87	102.37
3.....	102.80	102.80	*a*	104.33	103.57	103.32	101.87	102.27	102.02	102.92	103.02	102.32
4.....	102.90	102.75	*a*	104.18	103.32	103.12	101.92	103.62	101.87	102.67	103.07	102.32
5.....	102.95	102.70	*a*	104.33	104.57	103.02	101.87	104.27	102.52	102.62	103.12	102.32
6.....	103.00	102.65	*a*	104.43	104.17	103.72	101.62	103.72	102.57	102.57	103.17	102.32
7.....	103.05	102.65	*a*	104.23	103.72	104.67	101.72	103.47	102.72	102.82	103.17	102.37
8.....	103.00	102.85	*a*	104.03	103.57	103.97	101.87	102.97	102.62	102.62	103.12	102.47
9.....	102.95	102.95	*a*	104.48	103.07	103.57	101.77	102.77	102.37	102.62	103.07	102.42
10.....	102.90	102.90	102.48	104.18	103.12	103.27	101.97	102.82	102.22	102.62	103.12	102.52
11.....	103.00	103.00	102.63	103.43	103.22	103.12	102.47	104.42	102.12	102.62	103.42	102.32
12.....	103.00	103.00	102.88	103.33	103.02	103.37	102.17	103.82	102.12	102.52	103.32	102.32
13.....	102.90	103.00	103.08	102.98	102.62	103.32	102.02	103.62	102.07	102.47	103.12	102.32
14.....	102.90	103.00	103.18	102.88	102.47	103.07	101.92	103.17	102.17	102.42	103.02	102.37
15.....	102.80	103.00	102.98	102.93	102.52	102.97	101.92	102.52	102.02	102.42	102.87	102.37
16.....	102.80	103.05	102.88	103.68	102.57	103.07	101.92	102.37	101.87	102.42	102.62	102.32
17.....	102.90	102.95	102.83	103.83	102.27	102.77	102.07	102.27	101.82	102.32	102.52	102.32
18.....	102.90	102.90	102.73	103.63	102.72	103.47	102.02	102.27	101.87	102.32	102.52	102.32
19.....	103.20	103.05	102.78	104.33	103.52	103.52	101.92	102.27	101.87	102.32	102.52	102.22
20.....	103.70	103.25	102.78	104.83	103.12	102.92	101.92	102.07	101.82	102.42	102.52	102.22
21.....	104.50	103.50	102.88	104.30	103.62	102.77	101.92	102.17	101.82	102.52	102.52	102.32
22.....	104.95	103.30	103.08	103.97	103.32	102.62	102.07	102.12	101.82	102.62	102.52	102.27
23.....	104.40	103.05	103.43	103.92	103.12	102.52	102.17	102.12	101.82	102.62	102.52	102.22
24.....	103.95	102.90	103.73	103.57	103.12	102.37	101.92	102.12	101.87	102.62	102.42	102.52
25.....	103.70	102.95	104.63	103.37	104.22	102.32	101.92	102.12	102.37	103.12	102.42	102.42
26.....	103.55	103.00	105.38	103.17	104.52	102.22	101.92	102.22	102.57	103.17	102.42	102.32
27.....	103.25	103.50	104.43	103.37	104.22	102.12	101.92	102.17	102.17	102.87	102.17	102.42
28.....	103.20	*a*	104.63	103.92	103.52	102.02	104.47	102.02	105.92	102.62	102.12	102.52
29.....	103.10	......	106.43	103.87	103.07	102.02	103.32	101.92	104.92	102.37	102.22	102.52
30.....	103.10	......	106.28	103.57	103.37	102.02	102.72	101.92	104.07	103.12	102.32	102.72
31.....	103.10	......	106.13	......	103.57	......	102.47	101.87	......	102.92	......	102.92

a No record.

Current-meter Discharge Measurements of West Canada Creek at Wilmurt, N. Y.

DATE.	Hydrographer.	Gage Reading.			Meter No.	Lateral interval.	Submergence depth.	Area flowing.	Total area.	Total width.	Computed discharge.
		Beginning.	Ending.	Mean.							
1910.						*Feet.*		*Square feet.*	*Square feet.*	*Feet.*	*Second-feet.*
April 21	Patchke & Button.	4.20	4.10	4.15	559	10	6/10	509.78	509.78	155.3	1,742.24
May 6	Clark & Button...	4.20	4.20	4.20	559	5	6/10	484.96	484.96	155.3	1,741.94
May 14	H. V. Button.....	2.5	2.5	2.5	559	5	6/10	....	268.80	150.3	328.12
May 18	H. V. Button.....	2.8	2.8	2.8	559	5	6/10	....	310.91	150.3	518.09
May 19	H. V. Button.....	3.6	3.55	3.58	559	5	6/10	....	422.84	155.3	1,145.41
May 21	H. V. Button.....	3.9	4.0	3.95	559	5	6/10	....	475.15	155.3	1,601.23
May 23	H. V. Button.....	3.3	3.3	3.3	559	10	6/10	....	375.70	152.3	852.86
Aug. 11	Barrett & Patchke.	4.68	4.70	4.69	462	5	6/10	......	578.54	154.3	2,089.08
Aug. 12	Barrett & Patchke.	4.17	4.17	4.17	462	5	6/10	....	505.52	155.3	1,486.66
Aug. 31	A. R. Patchke....	2.20	2.21	2.20	559	5	6/10	....	176.18	149.3	105.07

GRAEFENBURG HYDROPHYSICAL STATION NEAR UTICA, N. Y.

GENERAL DESCRIPTION.

This station is located near Graefenburg reservoir, near Utica, about 4 miles south from the Mohawk river, and at altitude 1,100 feet above tide. This station was established in 1905 by Robert E. Horton for the purpose of determining the relation of rainfall, evaporation and ground water in the typical soils of the Mohawk valley. The station was maintained in coöperation with the U. S. Geological Survey preceding May 1, 1907, when it was turned over to this Department. A detailed description of the station, together with the records preceding 1907, may be found in the State Engineer's Report for 1906, supplement, pages 215–245.

The instrumental equipment is as follows: In the instrument shelter are placed a Green standard thermometer, also Green maximum and minimum thermometers; a Lambrecht hair hygrometer; and a 4½-inch Queen aneroid barometer, which has been calibrated by comparison with a standard mercurial barometer.

A hair hygrometer has been used in preference to a wet bulb thermometer, as it is considered more reliable in the hands of an ordinary observer for use in the winter time. It is periodically compared with a standard wet and dry bulb, or sling psychrometer, and the bundle of hairs is moistened on the first of each month to insure their retention of hygroscopic power.

A standard 8-inch rain gage, United States Weather Bureau pattern, having its rim 4.5 feet above ground is used; also a Robinson anemometer, 'United States Weather Bureau pattern, made by Julien P. Frieze, having its cups at the same altitude. The anemometer readings are taken directly from the dial twice each day, and the total wind movement is deduced by a reduction table based on Marvin's experiments.

Two Green soil thermometers, having their bulbs inserted in the natural soil beneath the grass sod, one to 2 inches and the other to 24 inches depth, are also used.

During the summer season, the evaporation from free water-surface is measured by means of a rectangular tank 3 feet square and 2 feet deep, buried in the soil to within 3 inches of the top. A brass needle projects in the center to within 3 inches of the top. The evaporation is determined each morning by means of a standard brass cup of 212 cubic centimeters capacity. One cupful represents 0.01 inch depth on the surface of the tank. The observer records the number of cupfuls added or removed each morning, in order to raise or reduce the water-level to the needle point. The standard evaporation tank is not used in the frozen season.

On December 1, 1904, two lysimeters were in place. Two additional lysimeter records were begun June 25, 1905, and another August 12, 1905. The lysimeters are galvanized iron tanks with wrought bands. They were filled by placing the tank (with the cover, which fits over the bottom, removed), upright on the ground, and driving the can downward over a prism of soil digging away at the sides as much as necessary in order to drive the can downward with a heavy hammer. After the can had been driven downward over a prism of soil to its full depth, the soil was dug away around the bottom, a temporary bottom inserted, and the tank and its contained soil were lifted sufficiently to enable the conical bottom to be put in position. The lysimeter was then placed upon a wooden foundation, and connected with the gage cans in the adjoining pit by means of a short ½-inch lead pipe. The first two cans installed were filled in this manner with soil *in situ,* which is a heavy clay, formed by disintegration of Utica shale, which lies at a depth of a few feet underneath the surface. Both lysimeters were left with the natural sod surface until August 1, 1905, after which date the grass growing on the second lysimeter has been cut short. Number 3 lysimeter was filled in the same manner with soil comprising a sandy loam surface soil to about 18 inches in depth, and beneath this heavy clay, similar to that in the first two lysimeters.

Numbers 4 and 5 were filled with a medium coarse, rather humus and open sand, found at a distance of about one mile from the station. These lysimeters, after being filled in the manner previously described, were closed at both ends and drawn to the station. When filling in the above described manner, an effort was made to obtain samples of the different soils in an undisturbed natural condition.

In the gage-pit are placed galvanized cans, one foot diameter and one foot deep, with close-fitting covers. Within these are smaller galvanized cans, made very accurately, each 0.535 foot inside diameter, and having a notch in one side, into which the drainage from the lysimeter is conducted through a short section of rubber hose, connected with the lead pipes described.

The smaller gage cans have a sectional area one-tenth that of the surface area of the lysimeters. The depth of the percolation is multiplied ten times in these cans. Care is taken to set the cans level, and the depth of percolation is measured by means of an ordinary rain gage stick.

In case of overflow from the small can into the larger can between two readings, the total amount is measured by successive fillings of the small can. If the rate of infiltration is slow, the water is left in the small can until it becomes nearly full. This is done in order to avoid, if possible, an error in measuring a very small quantity from the gage cans.

During periods of heavy rainfall or snow melting, the lysimeters, notably numbers 1 and 2, have frequently shown percolation in excess of the contemporaneous rainfall. During 1907 the lysimeters were unearthed, and it was found that excessive ground water probably entered the drain pipe around the bottom of the lysimeter at times; owing to this condition the lysimeter records, excepting for dry periods, are void preceding August, 1907. In August, 1907, the bottom of each lysimeter was bedded in cement mortar, which will, it is believed, effectively prevent any entrance of water at the bottoms.

A record of the depth of the natural ground water table below the soil surface is kept in an unused well adjacent to the lysimeter station.

GRAEFENBURG HYDROPHYSICAL RECORDS.

Month of January, 1908.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	201	.108	28.2			33.0	35.0		*0.01		.05	3.75	0	.17	3.70			
2	140	.085	23.0			32.0	35.0				.02	0	0	.04	1.32			
3	189	.087	23.5			32.0	35.0				.03	1.40	.01	0	.07			
4	391	.089	24.2			32.0	35.0		*0.03		.02	1.14	0	0	.06			
5	197	.040	6.0			32.0	35.0				0	.01	0	0	0			
6	208	.063	21.8			31.5	34.5				0	0	0	0	0			5.1
7	247	.113	24.2			31.0	34.0		*0.85		.03	0	0	0	0			
8	136	.129	27.8			31.0	34.0		0		0	0	0	0	0			
9	217	.073	14.5			32.0	34.0		*T		.02	0	0	0	0			
10	130	.052	11.8			32.0	34.0		0		0	0	0	0	0			
11	303	.105	23.0			32.0	34.0		0.08		0	0	0	0	0			
12	341	.175	33.5			32.0	34.0		0.18		0	0.64	0	0	0			
13	271	.113	23.5			32.0	34.0				.02	0	0	0	0			6.8
14	182	.076	16.5			32.0	34.0		*T		0	0	0	0	0			
15	266	.098	29.8			32.0	34.0				0	0	0	0	0			
16	351	.082	20.0			32.0	34.0				0	0	0	0	0			
17	193	.079	22.8			32.0	34.0				0	0	0	0	0			
18	281	.094	26.0			32.0	34.0		*0.02		0	0	0	0	0			
19	243	.066	15.5			32.0	34.0				0	0	0	0	0			
20	259	.104	33.0			32.0	34.0				0	0	0	0	0			7.2
21	264	.139	30.2			32.0	34.0				0	1.85	0	0	0			
22	292	.124	30.8			32.0	34.0				.02	2.12	0	.24	.92			
23	190	.083	17.8			31.5	34.0		*0.03		0	.01	0	.05	.01			
24	253	.047	8.5			31.0	34.0				0	0	0	0	0			
25	226	.080	22.5			30.0	34.0				0	0	0	0	0			
26	288	.111	26.8			30.5	34.0		*0.40		0	.57	0	.02	0			
27	295	.062	13.5			31.0	34.0		*0.02		0	1.27	0	.02	0			7.0
28	239	.074	18.2			31.0	34.0		*0.05		0	.01	0	0	0			
29	192	.034	0.5			30.5	34.0				0	0	0	0	0			
30	180	.018	9.8			30.0	34.0				0	0	0	0	0			
31	257	.042	6.8			30.0	34.0		*0.06		0	0	0	0	0			

T means trace. * Snow.

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of February, 1908.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	Mean Soil Temperature. 2 inches depth.	Mean Soil Temperature. 24 inches depth.	Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	Percolation Through Lysimeter *Inches.* 1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Accumulated Snow on Ground in Woods. *Inches.* Snow.	Water.	Depth to water in well. *Feet.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	470	.076	17 2			30.0	34 0		*0.19		0	0	0	0	0			
2	364	.046	7.0			30.0	34.0		0.02		0	0	0	.01	.02			
3	168	.037	2 8			29.5	33.5		0		0	0	0	0	0			7 5
4	180	.014	—13.8			29.0	33.0		0		0	0	0	0	0			
5	388	.038	1 2			29.0	33.0		0		0	0	0	0	0			
6	94	.081	20 2			29.0	33.0		*0.03		0	0	0	0	0			
7	123	.045	4.5			29.0	33.0		*0.03		0	0	0	0	0			
8	191	.019	—6.8			29.0	33.0		0		0	0	0	0	0			
9	100	.023	—1.5			30.0	33.0		0		0	0	0	0	0			
10	55	.046	19.0			30.0	33.0		0		0	0	0	0	0			8.6
11	126	.079	21.5			30.0	33.0		0		0	0	0	0	0			
12	256	.134	28.0			30.0	33.0		0.18		.31	.09	0	0	0			
13	177		35 0			31.0	33.0		0.05		2.90	3 60	.03	.95	3.67			
14	244		40.8			31.0	33.0		0.33		3.75	0	0	3.30	0			
15	300		34.5			31 0	33.0		0.28		3.75	0	0	0	0			
16	83		16 8			31.0	33.0		*0.05		.10	.72	.02	.61	2.58			
17			11.2			31.0	33.0		0.02		.02	0	0	0	.01			5.4
18			8.8			31.0	33.0		0		0	0	0	0	0			
19			15.8			31 0	33.0		*0.18		0	0	0	0	0			
20			14 0			31.0	33.0				0	0	0	0	0			
21			21.5			31.0	33.0				0	0	0	0	0			
22			12.5			31.0	33.0				0	0	0	0	0			
23	141	074	13.0			31.0	33.0		*0.05		0	0	0	0	0			
24	127	.069	12 8			31.0	33.0				0	0	0	0	0			6.9
25	368	.105	23.5			31.0	33.0		*0.02		0	0	0	0	0			
26	179	.141	27.5			31.0	33.0		*0.24		0	0	0	0	0			
27	241	.083	15 0			31.0	33.0				0	0	0	0	0			
28	344	.059	10.0			31.0	33.0		*0.01		0	0	0	0	0			
29	178	.056	8.0			31.0	33.0		0		0	0	0	0	0			

* Snow.

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of March, 1908.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	320	.106	19.2	......	......	31.0	32.5	......	1.00	......	0	0	0	0	0	......	......	7.5
2	240	.135	28.0	......	......	31.0	32.0	......	*.10	......	0	0	0	0	0	......	......	......
3	267	.097	20.8	......	......	31.0	32.0	......	.02	......	0	0	0	0	0	......	......	......
4	127	.087	19.2	......	......	31.0	32.0	......	......	......	2.93	2.98	0	.40	0	......	......	......
5	183	.086	19.0	......	......	31.0	32.0	......	......	......	.01	.01	0	.01	0	......	......	......
6	324	.140	29.2	......	......	31.0	32.0	......	.35	......	0	0	0	0	0	......	......	......
7	386	.140	31.8	......	......	31.0	32.0	......	......	......	0	0	0	0	0	......	......	......
8	165	.137	32.2	......	......	31.0	32.0	......	......	......	0	0	0	0	0	......	......	8.0
9	251	.069	17.2	......	......	31.0	32.0	......	......	......	0	0	0	0	0	......	......	......
10	234	.088	20.0	......	......	31.0	32.0	......	......	......	0	0	0	0	0	......	......	......
11	177	.153	36.8	......	......	31.0	32.0	......	......	......	0	0	0	0	0	......	......	......
12	168	.169	35.5	......	......	31.0	32.0	......	......	......	0	0	0	0	0	......	......	......
13	240	.175	40.0	......	......	31.0	32.0	......	.05	......	3.74	3.69	0	1.99	3.69	......	......	......
14	187	.157	35.0	......	......	31.0		......	......	......	3.75	0	0	1.78	3.70	......	......	......
15	309	.186	35.5	......	......	31.0		......	.16	......	3.75	0	0	1.62	3.70	......	......	8.6
16	233	.105	22.5	......	......	31.0		......	*.02	......	0.60	0	0	0.33	3.70	......	......	......
17	162	.092	20.0	......	......	31.0		......	.08	......	0	0.15	0	0	0.02	......	......	......
18	233	.122	25.0	......	......	31.0		......	.05	......	0	0	0	0	0	......	......	......
19	259	.108	22.5	......	......	31.0		......	.01	......	0	0	0	0	0	......	......	......
20	155	.056	16.0	......	......	31.0		......	......	......	6	0	0	0	0	......	......	......
21	193	.119	33.5	......	......	31.0	Broken—	......	......	......	3.15	3.55	0	.07	3.68	......	......	......
22	241	.167	45.2	......	......	31.0		......	......	......	3.75	0	0	0	3.70	......	......	6.8
23	152	.206	40.5	......	......	31.5		......	*.15	......	3.75	0	0	.16	3.70	......	......	......
24	287	.125	27.5	......	......	32.0		......	.04	......	3.75	0	0	.16	3.70	......	......	......
25	198	.093	25.0	......	......	32.0		......	......	......	3.75	0	0	0	3.70	......	......	......
26	296	.199	43.2	......	......	32.0		......	......	......	3.75	0	.20	.35	3.70	......	......	......
27	204	.259	43.2	......	......	34.0		......	......	......	1.50	0	.08	.15	3.70	......	......	......
28	253	.290	47.0	......	......	39.5		......	.22	......	2.46	0	.48	.15	3.70	......	......	......
29	260	.156	30.2	......	......	33.5		......	*.02	......	0.42	0	.28	.04	3.70	......	......	5.7
30	172	.135	32.2	......	......	33.0		......	......	......	.04	0	.12	.06	2.05	......	......	......
31	180	.168	36.2	......	......	32.5		......	......	......	.04	0	.08	.12	1.44	......	......	......

* Snow.

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of April, 1908.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	246	.128	32.8			34.5			.17		.04	2.77	.06	.18	1.55			
2	403	.175	33.5			34.5			*.05		.07	3.70	.08	.23	3.70			
3	277	.107	23.2			33.0			*.03		.01	3.10	.03	.07	1.30			
4	254	.065	16.0			32.0					.03	.35	.02	.02	0.15			
5	260	.160	33.0			32.0			.17		.12	3.35	.08	.02	1.60			
6	168	.197	47.2			33.0					.11	0	.18	.23	3.70			5.6
7	196	.198	36.2			39.0			.03		.02	0	.08	.13	3.70			
8	360	.212	38.5			35.5			.46		1.20	0	.30	.30	3.70			
9	200	.139	31.5			34.5					.66	0	.18	.25	3.70			
10	236	.243	43.8			37.5					.12	0	.09	.10	3.70			
11	486	.180	36.2			34.5			.02		.02	0	.03	.07	3.70			
12	278	.148	32.0			35.5			.03		.02	0	.02	.01	1.65			
13	172	.135	37.0			37.0					.01	0	.02	.02	.95			5.9
14	331	.147	48.2			39.0					.01	0	.01	.18	.40			
15	247	.245	45.8			38.5			.50		.51	0	.18	.07	3.70			
16	162	.084	27.0			36.5					.20	0	.12	.05	3.70			
17	110	.136	36.0			37.0					.01	0	.05	.04	2.95			
18	137	.238	42.5			34.5			.32		.04	0	.07	.06	3.70			
19	200	.195	38.2			40.0			.19		.47	0	.06	.21	3.70			
20	117	.141	32.5			35.5			*.18		.20	0	.19	.11	3.70			5.5
21	338	.147	35.8			34.5					.05	0	.08	.05	3.70			
22	155	.256	53.8			38.0					.03	0	.05	.06	3.60			
23	134	.284	57.5			46.0					.04	0	.03	.01	1.45			
24	227	.283	56.0			48.0					.01	1.92	.02	.02	.44			
25	259	.296	55.8			44.5					.02	.42	0	0	.12			
26	176	.309	56.5			52.5					.01	.14	.01	.01	.01			
27	191	339	50.2			50.0			.25		.01	.01	0	0	0			6.2
28	181	293	47.2			49.0			.03		0	0	0	0	0			
29	960	.235	40.2			45.5			.05		0	0	0	0	0			
30	275	.235	40.8			44.5			.80		.06	.90	.01	0	0			

*Snow.

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of May, 1908.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	263	.185	36.2			41.0			.02		.17	2.65	.21	.14	3.14			
2	232	.158	33.5			40.5			.15		.05	0	.09	.12	3.70			
3	196	.173	39.0			43.0			.04		.08	0	.10	.08	3.70			
4	142	.160	42.8			45.5					.05	0	.05	.05	2.20			5.9
5	132	.150	53.2			39.0					.03	0	.03	.02	.62			
6	320	.272	48.0			44.5			.14		.02	2.25	.02	.01	.09			
7	490	.248	40.8			41.5			1.22		.55	3.70	.54	.49	2.99			
8	155	.280	44.5			43.5			.05		1.13	0	.24	.38	3.70			
9	255	.261	42.2			44.5			.34		.93	0	.12	.13	3.70			
10	216	.236	45.0			41.0					1.05	0	.13	.15	3.70			
11	205	.148	41.5			47.0					.15	0	.57	.07	3.70			5.6
12	209	.213	44.5			53.0			.02		.04	0	.10	.03	1.62			
13	174	.353	52.5			53.0			.20		.01	3.09	.01	0	.11			
14	162	.300	50.2			51.0			.28		0	2.80	.01	.01	.10			
15	97	.212	45.8			45.5					.02	3.70	.03	.02	.19			
16	157	.306	53.0			51.5			.27		.02	0	0	.02	0			
17	125	.361	55.5			55.0					.01	.07	.55	0	.10			
18	120	.320	53.8			53.0					.01	.01	.18	.01	.03			6.2
19	263	.379	60.0			57.0			.02		.01	.02	.06	.01	.02			
20	227	.495	60.5			56.0			.03	.11	0	0	0	0	0			
21	242	.510	59.5			58.5				.11	0	0	0	0	0			
22	176	.553	65.8			61.0			.27	.02	0	0	0	0	0			
23	114	.489	66.0			62.0			.45	.15	0	0	0	0	0			
24	130	.369	62.2			65.5				.14	.03	.53	0	0	0			
25	140	.484	69.5			59.5				.20	0	0	0	0	0			7.3
26	111	.592	66.2			64.0			.44		0	0	0	0	0			
27	126	.518	64.0			63.5				.18	.03	0	0	0	.01			
28	140	.525	67.0			65.5				.12	0	0	0	0	.01			
29	135	.587	65.5			64.0			.04	.14	0	0	0	0	0			
30	91	.559	66.2			62.5			.22	.17	0	0	0	0	0			
31	97	.444	58.2			62.5			.16		0	0	0	0	0			

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of June, 1908.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	123	.363	52.0			60.0			.02	.17	0	0	0	0	0			7.3
2	154	.294	52.8			57.5				.20	0	0	0	0	0			
3	121	.332	56.0			56.0				.24	0	0	0	0	0			
4	116	.336	63.8			58.0				.20	0	0	0	0	0			
5	84	334	60.0			58.0				.18	0	0	0	0	0			
6	85	.424	67.2			59.5				.15	0	0	0	0	0			
7	83	.558	73.8			62.0				.20	0	0	0	0	0			
8	119	.574	76.0			67.0			.56	.71	0	0	0	0	0			7.8
9	95	.558	66.5			68.5					0	0	0	0	0			
10	102	.421	59.2			64.5				.12	0	0	0	0	0			
11	80	.367	54.5			61.5				.13	0	0	0	0	0			
12	65	.395	60.5			67.5				.15	0	0	0	0	0			
13	112	.508	69.2			65.0				.20	0	0	0	0	0			
14	132	.554	65.8			67.5			.06	.14	0	0	0	0	0			
15	126	.389	53.2			62.5			.75	.15	0	0	0	0	0			9.5
16	137	.306	56.5			59.5				.15	0	0	0	0	0			
17	67	.366	59.5			58.0				.10	0	0	0	0	0			
18	135	.469	66.5			62.5				.20	0	0	0	0	0			
19	118	.665	75.2			68.0			.19	.17	0	0	0	0	0			
20	204	.542	71.0			68.5				.18	0	0	0	0	0			
21	102	.587	75.0			68.5				.20	0	0	0	0	0			
22	74	.649	73.8			70.5				.16	0	0	0	0	0			10.6
23	65	.678	72.2			70.0			.10	.08	0	0	0	0	0			
24	162	.594	68.2			70.0			.09	.16	0	0	0	0	0			
25	112	.443	64.2			67.5				.22	0	0	0	0	0			
26	63	.367	61.0			65.5				.18	0	0	0	0	0			
27	59	.424	69.5			67.0				.20	0	0	0	0	0			
28	91	.524	68.5			67.0				.23	0	0	0	0	0			
29	132	.558	64.8			68.0				.13	0	0	0	0	0			11.8
30	105	.451	63.5			67.0				.16	0	0	0	0	0			

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued.*)

Month of July, 1908.

AY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	61	.573	73.5	....	....	67.0	....	....	....	.13	0	0	0	0	0	....	....	....
2	70	.627	70.8	....	....	69.0	....	....	....	.13	0	0	0	0	0	....	....	....
3	101	.686	74.0	....	....	70.5	....	....	....	.12	0	0	0	0	0	....	....	....
4	115	.733	75.8	....	....	70.0	....	....	.04	.06	0	0	0	0	0	....	....	....
5	87	.617	73.5	....	....	71.5	....	....	....	.11	0	0	0	0	0	....	....	....
6	78	.654	75.0	....	....	71.0	....	....	....	.20	0	0	0	0	0	....	....	11.8
7	153	.635	70.2	....	....	73.0	....	....	.25	.17	0	0	0	0	0	....	....	....
8	198	.361	58.5	....	....	66.0	....	....	....	.22	0	0	0	0	0	....	....	....
9	27	.447	65.5	....	....	64.5	....	....	....	.13	0	0	0	0	0	....	....	....
10	120	.446	71.0	....	....	64.0	....	....	....	.18	0	0	0	0	0	....	....	....
11	114	.561	80.8	....	....	70.0	....	....	....	.29	0	0	0	0	0	....	....	....
12	94	.619	76.2	....	....	72.5	....	....	....	.15	0	0	0	0	0	....	....	....
13	110	.541	69.5	....	....	70.5	....	....	.09	.16	0	0	0	0	0	....	....	13.6
14	99	.496	62.5	....	....	69.0	....	....	....	.14	0	0	0	0	0	....	....	....
15	158	.397	63.2	....	....	66.0	....	....	.10	.01	0	0	0	0	0	....	....	....
16	153	.355	61.5	....	....	65.0	....	....	....	.23	0	0	0	0	0	....	....	....
17	182	.542	64.0	....	....	62.5	....	....	.75	.01	0	0	0	0	0	....	....	....
18	89	.677	68.5	....	....	66.0	....	....	1.70	....	.05	1.68	0	0	.78	....	....	....
19	117	.564	64.0	....	....	68.0	....	....	....	.10	0	.01	0	0	.01	....	....	....
20	77	.531	69.8	....	....	69.5	....	....	....	.13	0	0	0	0	0	....	....	14.5
21	86	.614	67.8	....	....	67.5	....	....	.92	.01	0	0	0	0	0	....	....	....
22	72	.646	70.8	....	....	69.5	....	....	.10	.05	0	0	0	0	0	....	....	....
23	62	.619	72.8	....	....	70.0	....	....	....	.11	0	0	0	0	0	....	....	....
24	95	.554	70.2	....	....	70.5	....	....	.02	.03	0	0	0	0	0	....	....	....
25	78	.594	68.5	....	....	70.5	....	....	....	.16	0	0	0	0	0	....	....	....
26	39	.529	74.8	....	....	70.5	....	....	....	.18	0	0	0	0	0	....	....	....
27	77	....	74.5	....	....	71.5	....	....	....	.16	0	0	0	0	0	....	....	14.8
28	70	....	78.5	....	....	73.0	....	....	....	.20	0	0	0	0	0	....	....	....
29	71	.653	82.2	....	....	73.0	....	....	....	.14	0	0	0	0	0	....	....	....
30	92	.638	79.2	....	....	74.0	....	....	....	.16	0	0	0	0	0	....	....	....
31	108	.554	69.5	....	....	73.5	....	....	....	.22	0	0	0	0	0	....	....	....

Graefenburg Hydrophysical Records — (*Continued*).

Month of August, 1908.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	Mean Soil Temperature. 2 inches depth.	Mean Soil Temperature. 24 inches depth.	Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	Percolation Through Lysimeter. *Inches.* 1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Accumulated Snow on Ground in Woods. *Inches.* Snow.	Water.	Depth to water in well. *Feet.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	93	.476	71.0	....	....	72.0	....	....	....	.28	0	0	0	0	0	....	....	....
2	160	.541	69.2	....	....	69.5	....	....	....	.22	0	0	0	0	0	....	....	....
3	61	.551	69.8	....	....	66.5	....	....	....	.15	0	0	0	0	0	....	....	14.9
4	102	.620	72.0	....	....	71.5	....	....	.13	.10	0	0	0	0	0	....	....	....
5	78	.629	67.8	....	....	70.5	....	....	.76	.04	.09	0	0	0	0	....	....	....
6	64	.526	66.2	....	....	71.0	....	....	.14	.08	0	0	0	0	0	....	....	....
7	64	.548	62.2	....	....	69.0	....	....	.38	.04	0	0	0	0	0	....	....	....
8	106	.522	63.2	....	....	68.5	....	....	....	.15	0	0	0	0	0	....	....	....
9	55	.533	68.2	....	....	69.0	....	....	....	.15	0	0	0	0	0	....	....	....
10	50	.496	66.8	....	....	69.0	66.0	....	....	.05	0	0	0	0	0	....	....	15.3
11	62	.565	68.0	....	....	70.0	66.0	....	.14	.15	0	0	0	0	0	....	....	....
12	121	.658	75.0	....	....	69.5	66.0	....	.12	.12	0	0	0	0	0	....	....	....
13	100	.653	71.2	....	....	70.5	66.0	....	.09	.07	0	0	0	0	0	....	....	....
14	96	.567	68.2	....	....	71.5	66.0	....	....	.12	0	0	0	0	0	....	....	....
15	86	.467	69.0	....	....	73.0	66.0	....	....	.15	0	0	0	0	0	....	....	....
16	169	.515	68.8	....	....	70.5	66.0	....	.35	.27	0	0	0	0	0	....	....	....
17	132	.602	67.5	....	....	70.0	66.0	....	1.70	1.86	0	0	0	0	0	....	....	15.5
18	188	.390	61.2	....	....	68.5	66.0	....	....	.17	0	1.82	0	0	.01	....	....	....
19	102	.385	59.5	....	....	64.0	66.0	....	....	.18	0	.01	0	0	.02	....	....	....
20	129	.341	62.0	....	....	63.0	65.0	....	....	.16	.03	0	0	0	0	....	....	....
21	167	.490	63.0	....	....	62.5	65.5	....	....	.17	0	0	0	0	0	....	....	....
22	152	.524	64.0	....	....	66.5	64.0	....	.07	.17	0	0	0	0	0	....	....	....
23	109	.354	60.8	....	....	66.0	64.0	....	....	.18	0	0	0	0	0	....	....	....
24	73	.354	57.0	....	....	63.0	64.0	....	....	.16	0	0	0	0	0	....	....	15.6
25	73	.378	57.8	....	....	63.5	64.0	....	....	.12	0	0	0	0	0	....	....	....
26	96	.397	57.5	....	....	64.5	63.0	....	....	.12	0	0	0	0	0	....	....	....
27	96	.384	57.5	....	....	64.0	63.0	....	....	.14	0	0	0	0	0	....	....	....
28	101	.354	58.5	....	....	64.0	63.0	....	....	.17	0	0	0	0	0	....	....	....
29	60	.432	63.8	....	....	65.5	63.0	....	....	.16	0	0	0	0	0	....	....	....
30	57	.447	66.2	....	....	66.5	63.0	....	....	.12	0	0	0	0	0	....	....	....
31	99	.488	68.8	....	....	63.0	63.0	....	....	.10	.02	0	0	0	0	....	....	15.7

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*.

Month of September, 1908.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	159	.525	72.0			68.5	63.0		.02	0.16	0	0	0	0	0			
2	153	372	57.2			66.5	63.0		.05	07	0	0	0	0	0			
3	106	.308	50.5			61.5	63.0			.17	0	0	0	0	0			
4	130	.305	63.2			62.5	63.0			.09	0	0	0	0	0			
5	163	.416	67.2			65.0	62.5			.11	0	0	0	0	0			
6	148	.548	63.0			66.0	62.0		1.28	.28	0	.64	0	0	0			
7	92	.408	60.0			63.0	62.0			.15	0	0	0	0	0			16.1
8	78	.361	60.8			62.0	62.0			.10	0	0	0	0	0			
9	145	.343	67.5			63.0	62.0			.13	0	0	0	0	0			
10	102	.438	66.0			65.0	62.0			.09	0	0	0	0	0			
11	54	.544	66.8			64.5	62.0			.04	0	0	0	0	0			
12	54	.575	64.0			65.0	62.0			.09	0	0	0	0	0			
13	49	.442	63.0			65.0	62.0			.06	0	0	0	0	0			
14	112	.274	56.8			64.5	62.0			.24	0	0	0	0	0			16.3
15	97	.257	55.2			61.5	62.0			.13	0	0	0	0	0			
16	77	.293	57.2			65.0	62.0			.15	0	0	0	0	0			
17	106	.303	57.0			60.5	61.0			.14	0	0	0	0	0			
18	82	.436	61.2			60.5	61.0			.03	0	0	0	0	0			
19	155	330	57.8			62.0	60.0			.14	0	0	0	0	0			
20	153	.337	57.2			59.5	60.0			.17	0	0	0	0	0			
21	80	.548	63.5			61.5	60.0			.07	0	0	0	0	0			16.5
22	82	.577	65.5			64.0	60.0			0	0	0	0	0	0			
23	36	.569	64.5			64.0	60.0			.03	0	0	0	0	0			
24	77	.556	68.5			65.0	60.0			.10	0	0	0	0	0			
25	68	.556	68.0			66.0	61.0			.06	0	0	0	0	0			
26	92	.597	68.0			66.0	61.0			.09	0	0	0	0	0			
27	113	.554	65.2			65.5	62.0			.10	0	0	0	0	0			
28	191	.448	59.2			64.5	62.0		1.60	2.35	0	0	0	0	0			16.7
29	111	.202	45.2			59.0	62.0			.10	0	0	0	0	0			
30	176	.243	52.2			59.5	61.0			.06	0	.03	0	0	0			

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of October, 1908.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE. 2 inches depth.	MEAN SOIL TEMPERATURE. 24 inches depth.	Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.* 1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.* Snow.	Water.	Depth to water in well. *Feet.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	104	.314	48.2			55.0	60.5		.48	.02	0	0	0	0	0			
2	163	.184	40.8			52.5	59.0			.13	0	0	0	0	0			
3	108	.196	43.8			50.0	58.0			.10	0	0	0	0	0			
4	54	.268	47.5			51.0	57.0			.06	0	0	0	0	0			
5	64	.258	44.5			53.0	57.0			.03	0	0	0	0	0			16.4
6	112	.255	50.5			52.5	56.0			.10	0	0	0	0	0			
7	120	.295	53.2			53.0	56.0			.07	0	0	0	0	0			
8	70	.393	54.8			54.5	56.0			.08	0	0	0	0	0			
9	96	.271	44.5			55.0	57.0			.03	0	0	0	0	0			
10	170	.288	49.0			51.0	56.0		1.05	.15	0	0	0	0	0			
11	154	.310	47.5			52.5	56.0		.15	.08	0	0	0	0	0			
12	100	.144	37.8			49.5	55.0			.03	0	0	0	0	0			16.5
13	128	.160	44.0			48.5	55.0			.10	0	0	0	0	0			
14	115	.438	42.5			47.0	54.0			.10	0	0	0	0	0			
15	66	.335	56.0			53.0	53.0			.05	0	0	0	0	0			
16	86	.350	57.8			54.5	53.0			.09	0	0	0	0	0			
17	55	.352	57.5			55.0	54.0			0	0	0	0	0	0			
18	92	.366	59.2			55.0	54.0			07	0	0	0	0	0			
19	92	.241	47.0			56.0	54.0			.08	0	0	0	0	0			16.5
20	152	.139	40.5			50.5	54.0			.07	0	0	0	0	0			
21	94	.159	35.8			47.5	54.0			.02	0	0	0	0	0			
22	145	.152	44.8			47.0	54.0			.05	0	0	0	0	0			
23	186	.358	52.2			47.5	52.0			05	0	0	0	0	0			
24	189	.406	58.0			52.5	52.0		.04	.02	0	0	0	0	0			
25	184	.407	60.5			55.5	52.5		.03	.01	0	0	0	0	0			
26	133	.395	55.2			55.5	53.5		.35	.23	0	0	0	0	0			16.6
27	949	.327	50.0			56.5	54.0		.15	.03	0	0	0	.01	0			
28	260	.318	48.5			52.5	54.0		.50	0	0	0	0	0	0			
29	67	.301	49.5			52.0	53.0				0	0	0	0	0			
30	232	.180	42.5			54.5	53.0			.10	0	0	0	0	0			
31	249	.110	32.0			43.5	52.5			.08	0	0	0	0	0			

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of November, 1908.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	184	.106	28.8	......	......	45.0	51.0	......	......	.07	0	0	0	0	0	......	......	......
2	165	.156	34.5	......	......	48.0	50.0	......	......	.06	0	0	0	0	0	......	......	16.6
3	84	.203	42.5	......	......	41.5	49.0	......	.10	.13	0	0	0	0	0	......	......	......
4	384	.416	26.5	......	......	42.5	48.0	......	......	.04	0	0	0	0	0	......	......	......
5	159	.135	26.8	......	......	43.5	48.0	......	*.03	......	0	0	0	0	0	......	......	......
6	238	.165	31.5	......	......	38.0	48.0	......	*.12	......	0	0	0	0	0	......	......	......
7	186	.189	37.2	......	......	41.5	45.0	......	.02	......	0	0	0	0	0	......	......	......
8	102	.225	40.2	......	......	39.0	45.0	......	......	......	0	0	0	0	0	......	......	......
9	106	.221	41.5	......	......	40.0	45.0	......	......	......	0	0	0	0	0	......	......	16.5
10	150	.226	39.0	......	......	40.0	45.0	......	.25	......	0	2.69	0	0	0	......	......	......
11	209	.200	36.0	......	......	40.5	45.0	......	.20	......	0	.01	0	0	0	......	......	......
12	283	.140	28.2	......	......	40.5	45.0	......	*.07	......	0	0	0	0	0	......	......	......
13	245	.340	44.5	......	......	39.5	45.0	......	......	......	0	.01	0	0	0	......	......	......
14	121	.321	44.0	......	......	37.5	45.0	......	*.13	......	0	0	0	0	0	......	......	......
15	300	.100	28.0	......	......	37.5	45.0	......	......	......	0	0	0	0	0	......	......	......
16	158	.125	30.5	......	......	34.5	44.0	......	*.04	......	0	0	0	0	0	......	......	16.3
17	211	.405	27.2	......	......	35.0	43.0	......	*.05	......	0	0	0	0	0	......	......	......
18	91	.160	30.8	......	......	35.0	43.0	......	.04	......	0	0	0	0	0	......	......	......
19	175	.176	37.5	......	......	35.0	43.0	......	.04	......	0	0	0	0	0	......	......	......
20	105	.148	29.0	......	......	36.0	42.5	......	......	......	0	0	0	0	0	......	......	......
21	48	.154	34.5	......	......	37.5	42.0	......	......	......	.03	.01	.05	0	.05	......	......	......
22	151	.190	38.5	......	......	36.0	42.0	......	......	......	.35	0	.46	.01	0	......	......	......
23	152	.225	47.0	......	......	40.5	42.0	......	......	......	.03	2.95	0	0	.12	......	......	16.3
24	152	.214	48.5	......	......	42.5	42.0	......	......	......	0	0	0	0	.30	......	......	......
25	118	.238	52.5	......	......	44.0	43.0	......	......	......	0	.01	0	0	0	......	......	......
26	238	.276	52.2	......	......	46.0	44.0	......	.02	......	0	0	0	0	0	......	......	......
27	304	.175	37.5	......	......	46.0	44.0	......	.01	......	0	0	.04	0	.05	......	......	......
28	212	.173	35.5	......	......	39.5	44.0	......	......	......	0	0	0	0	0	......	......	......
29	163	.170	37.8	......	......	39.0	44.0	......	......	......	0	0	0	0	0	......	......	......
30	225	.230	46.5	......	......	44.0	43.0	......	.10	......	.42	.67	.23	0	.03	......	......	16.2

* Snow.

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of December, 1908.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	220	.153	27.5	....	....	42.0	44.0	....	....	....	0	0	0	0	0	....	....	....
2	267	.079	17.5	....	....	40.5	43.5	....	*.03	....	0	0	0	0	0	....	....	....
3	187	.088	17.5	....	....	36.5	41.5	....	....	....	0	0	0	0	0	....	....	....
4	188	.104	27.5	....	....	34.5	42.5	....	*.03	....	0	0	0	0	0	....	....	....
5	217	.060	11.8	....	....	34.0	42.0	....	....	....	0	0	0	0	0	....	....	....
6	200	.069	17.2	....	....	34.0	41.5	....	*.20	....	0	0	0	0	0	....	....	16.5
7	319	.128	28.8	....	....	34.0	41.0	....	.31	....	0	0	0	0	0	....	....	....
8	248	.087	24.0	....	....	34.0	41.0	....	....	....	0	0	0	0	0	....	....	....
9	162	.062	14.0	....	....	33.5	40.0	....	*.02	....	0	0	0	0	0	....	....	....
10	72	.051	6.2	....	....	33.0	39.0	....	*.03	....	2.95	3.02	0	.01	.22	....	....	....
11	277	.122	24.5	....	....	33.0	39.0	....	*.36	....	.03	.01	0	0	.01	....	....	....
12	234	.115	25.5	....	....	33.0	39.0	....	*.02	....	.03	0	.10	0	.01	....	....	....
13	225	.135	25.2	....	....	33.0	39.0	....	....	.10	.04	0	0	0	0	....	....	16.6
14	147	.149	27.5	....	....	33.0	39.0	....	*.15	....	0	0	0	0	0	....	....	....
15	170	.183	35.5	....	....	33.0	38.0	....	....	....	.20	0	0	0	0	....	....	....
16	161	.137	27.2	....	....	33.0	38.0	....	....	....	.18	0	0	0	0	....	....	....
17	243	.081	19.5	....	....	33.0	38.0	....	*.05	....	.12	0	0	0	0	....	....	....
18	220	.085	16.5	....	....	32.0	38.0	....	....	....	0	0	0	0	0	....	....	....
19	239	.113	28.2	....	....	32.0	38.0	....	*.06	....	0	0	0	0	.03	....	....	....
20	224	.105	27.2	....	....	32.0	38.0	....	....	.11	0	0	.15	0	0	....	....	16.4
21	262	.080	19.5	....	....	32.0	38.0	....	*.02	....	.45	0	0	0	0	....	....	....
22	162	.046	9.0	....	....	32.0	38.0	....	....	....	.01	0	.40	0	.28	....	....	....
23	204	.053	13.2	....	....	32.5	37.0	....	....	....	0	0	0	0	0	....	....	....
24	154	.131	30.5	....	....	33.0	37.0	....	*.02	....	0	0	0	0	0	....	....	....
25	286	.189	34.2	....	....	33.0	37.0	....	*.06	....	0	0	.01	0	0	....	....	....
26	48	.134	27.0	....	....	33.0	37.0	....	*.04	....	0	0	.01	0	0	....	....	....
27	280	.110	31.2	....	....	32.5	37.0	....	....	.12	.01	0	0	0	0	....	....	16.1
28	158	.115	25.5	....	....	32.0	37.0	....	....	....	0	.01	0	0	0	....	....	....
29	225	.113	24.8	....	....	32.0	37.0	....	.20	....	.06	0	.01	0	0	....	....	....
30	255	.155	31.5	....	....	32.0	37.0	....	....	....	0	0	0	0	0	....	....	....
31	279	.110	22.8	....	....	32.0	37.0	....	*.03	....	.32	.30	0	0	.02	....	....	....

* Snow.

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of January, 1909.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	247	.054	9.2			32.5	37.5		.03		0	0		0	0			
2	209	.053	11.8			32.5	36.0				.03	0		0	0			
3	126	.062	11.8			32.5	37.0		*.05		0	0	.05	0	0			12.6
4	217	.204	36.0			38.0	37.0				1.87	1.94	1.00	.25	.20			
5	90	.255	41.2			35.0	33.0		.18		3.52	1.23	1.40	2.85	.10			
6	298	.094	18.8			32.5	36.5				3.50	.02	.38	2.40	.08			
7	100	.029	3.8			32.5	37.0				2.85	0	.12	1.04	.02			
8	162	.058	12.8			31.0	34.0					0	.08	.10	.02			
9	225	.136	29.0			30.5	35.5		*.02		.01	.01	0	0	0			
10	175	.194	35.2			31.0	35.0		.11		.01	0	0	0	0			10.4
11	173	.126	24.8			31.0	35.0		.10		.04	.01	0	.01	.01			
12	74	.066	13.0			31.0	35.0		*.44		0	0	0	0	0			
13	305	.047	7.8			31.0	35.0		*.03		0	.01	0	.01	.02			
14	262	.123	28.5			31.0	35.0		.15		0	0	0	0	0			
15	172	.058	14.5			31.0	35.0				0	0	0	0	0			
16	304	.033	2.5			31.0	35.0		*.30		0	0	0	0	0			
17	338	.050	12.2			31.0	35.0		*.35		0	0	0	0	0			9.6
18	130	.037	9.0			31.0	35.0				0	0	0	0	0			
19	270	084	19.5			31.0	35.0				0	0	0	0	0			
20	179	.118	24.5			31.0	35.0				.10	.42	0	.38	.03			
21	260	.147	42.0			31.0	35.0				.10	.35	0	.10	.02			
22	157	.203	45.5			31.0	35.0				3.15	2.90	0	.14	.06			
23	182	.306	46.8			31.0	35.0		.20		3.75	0	.09	3.01	0			
24	187	.236	39.2			31.0	34.0		.06		3.75	0	.34	3.75	.14			8.7
25	272	.134	33.0			31.0	34.0				1.35	0	.11	.20	.04			
26	222	.094	26.2			32.0	34.0				.25	0	.06	.08	.02			
27	295					32.0	34.0		*.02		.10	0	.04	.04	0			
28	166					32.0	34.0				.05	0	.01	.02	.02			
29	257	.085	14.8			32.0	34.0		*.25		.01	.10	0	01	0			
30	203	.071	13.2			32.0	34.0		*.07		.04	.10	.01	.01	0			
31	147	.047	6.5			32.0	34.0						.01		.02			

* Snow.

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of February, 1909.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	193	.061	10.0			28.0	34						0		0			8 7
2	91	.063	14.8			28.0	34		*.04				0		0			
3	130	.048	7.2			28.0	34				0		0		0			
4	274	.154	33.8			28.0	34				.30		0		0			
5	260	.264	46.0			29.5	34		.04		2.95	2.92	.13		.02			
6	314	151	32.0			31.0	34		.05		.72	0	.13		0			
7	126	.112	28.2			31.0	34				.02	1.95	.03		.01			
8	182	.091	19.2			31.0	34				.01	.05	.02	.01	.01			8 5
9	384	.071	13.2			31.0	34		*.10		0	0	0	0	.01			
10	202	.104	22.5			31.0	34		*.30		0	0	0	0	0			
11	262	.081	18.5			31.0	34		*.04		0	0	0	0	0			
12	244	.156	32.2			31.0	34				.01	0	0	0	0			
13	159	.141	28.0			31.0	34				0	0	0	0	0			
14	218	.095	21.5			31.0	34		*.60		0	0	0	0	0			
15	66	.121	22.8			31.0	34		*1.55		0	0	0	0	0			8.5
16	170	.121	24.5			31.0	34		*.45		2.99	3.65	.02	1.75	3.25			
17	153	.079	18.2			31.0	34		*.03		3.75	0	0	1.13	3.70			
18	112	.097	21.5			31.0	34				3.75	0	0	.90	2.75			
19	342	.171	31.8			31.0	34		.79		1.80	1.50	0	.10	1.65			
20	354	.138	29.0			31.0	34		*.05		1.20	1.10	0	2.10	1.15			
21	100	.106	26.8			31.0	34				.10	.10	0	.01	.16			
22	119	.140	33.2			31.0	34				0	0	0	0	0			8.4
23	385	.166	32.0			31.0	34		.55		0	0	0	0	0			
24	341	.136	30.8			31.0	34		.60		.02	0	0	0	0			
25	385	.048	11.5			31.0	34		*.03		.03	0	0	0	0			
26	68	.095	22.0			31.0	34				3.60	3.60	.01	0	3.54			
27	108	.138	27.2			31.0	34		.02		3.75	0	0	0	3.70			
28	156	.073	14.5			31.0	34				.02	.01	0	0	.01			

* Snow.

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of March, 1909.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	206	.117	24.5	......	......	30	33	......	*.03	......	0	0	0	0	0	......	......	8.4
2	166	.141	30.0	......	......	30	33	......	*.05	......	0	0	0	0	0	......	......	......
3	313	.132	28.5	......	......	30	33	......	*1.30	......	0	0	0	0	0	......	......	......
4	315	.084	17.5	......	......	30	33	......	*.03	......	0	0	0	0	0	......	......	......
5	342	.054	14.8	......	......	30	33	......	*.09	......	0	0	0	0	0	......	......	......
6	138	.077	21.8	......	......	30	33	......	......	......	0	0	0	0	0	......	......	......
7	207	.104	23.2	......	......	30	33	......	......	......	0	0	0	0	0	......	......	......
8	160	.069	20.5	......	......	30	33	......	.28	......	0	0	0	0	0	......	......	8.2
9	220	.187	31.8	......	......	30	33	......	.10	......	0	0	0	0	0	......	......	......
10	......	.202	34.0	......	......	30	33	......	*.02	......	0	0	0	0	0	......	......	......
11	......	.102	22.2	......	......	30	33	......	......	......	0	0	0	0	0	......	......	......
12	......	.112	27.0	......	......	30	33	......	*.05	......	0	0	0	0	0	......	......	......
13	......	.133	27.2	......	......	30	33	......	......	......	0	0	0	0	0	......	......	......
14	......	.112	26.5	......	......	30	33	......	......	......	0	0	0	0	0	......	......	......
15	......	.086	23.0	......	......	30	33	......	*.05	......	0	0	0	0	0	......	......	8.2
16	......	.123	26.2	......	......	30	33	......	*.07	......	0	0	0	0	0	......	......	......
17	......	.092	19.2	......	......	30	33	......	......	......	0	0	0	0	0	......	......	......
18	......	.093	21.0	......	......	30	33	......	*.10	......	0	0	0	0	0	......	......	......
19	......	.115	25.2	......	......	30	33	......	......	......	0	0	0	0	0	......	......	......
20	......	.099	25.2	......	......	30	33	......	......	......	0	0	0	0	0	......	......	......
21	158	.066	21.0	......	......	30	33	......	......	......	0	0	0	0	0	......	......	8.3
22	184	.080	21.0	......	......	30	33	......	......	......	.43	0	0	0	0	......	......	......
23	168	.098	25.0	......	......	30	33	......	*.32	......	.03	.09	0	0	0	......	......	......
24	245	.145	32.8	......	......	30	33	......	*.76	......	.12	.30	0	0	0	......	......	......
25	333	.168	30.2	......	......	30	33	......	*.02	......	.20	.52	0	0	.19	......	......	......
26	208	.128	27.2	......	......	31	33	......	*.10	......	2.90	2.78	0	.01	.70	......	......	......
27	225	.138	31.8	......	......	31	34	......	......	......	3.70	0	0	0	2.80	......	......	......
28	128	.153	29.2	......	......	31	34	......	......	......	3.70	0	0	.02	3.70	......	......	......
29	205	.146	30.2	......	......	31	33	......	......	......	.85	0	0	0	2.00	......	......	8.4
30	244	.163	30.5	......	......	30	33	......	......	......	0	.01	0	0	.01	......	......	......
31	300	.152	31.0	......	......	30	33	......	......	......	.05	.01	0	0	0	......	......	......

* Snow.

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of April, 1909.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	141	.144	29.2	....	....	30.0	33.0	....	....	....	2.80	3.68	0	0	3.69	....	....	....
2	88	.173	34.2	....	....	31.0	33.0	....	.09	....	1.03	0	0	0	3.70	....	....	....
3	154	.190	36.2	....	....	32.0	33.0	....	....	....	1.28	0	0	0	3.70	....	....	....
4	175	.151	30.8	....	....	32.0	33.0	....	....	....	1.87	0	0	0	3.70	....	....	....
5	211	.217	47.0	....	....	32.0	33.0	....	....	....	1.56	0	0	0	3.70	....	....	7.1
6	130	.383	56.0	....	....	32.0	33.0	....	.17	....	1.56	0	.20	.24	3.70	....	....	....
7	325	.227	42.8	....	....	32.0	33.0	....	....	....	1.40	0	.10	.12	3.70	....	....	....
8	207	.133	33.5	....	....	32.0	33.0	....	* .07	....	1.42	0	.04	.10	3.70	....	....	....
9	205	.145	28.5	....	....	32.0	33.0	....	* .10	....	1.30	0	.13	.55	3.70	....	....	....
10	294	.092	20.8	....	....	32.0	33.0	....	* .01	....	.08	0	.07	.06	3.70	....	....	....
11	137	.105	31.8	....	....	33.5	33.0	....	....	....	.06	0	.09	.06	3.70	....	....	....
12	246	.200	51.8	....	....	35.0	33.0	....	....	....	.08	0	.09	.06	3.70	....	....	6.0
13	320	.313	52.8	....	....	35.0	33.0	....	.95	....	1.00	0	.35	.11	3.70	....	....	....
14	102	.198	34.2	....	....	35.0	33.0	....	.50	....	2.75	0	.43	.66	3.70	....	....	....
15	133	.163	38.2	....	....	35.0	33.0	....	....	....	2.20	0	.34	.20	3.70	....	....	....
16	158	.206	47.8	....	....	35.0	34.0	....	.01	....	.75	0	.11	.12	3.70	....	....	....
17	127	.589	73.5	....	....	34.5	37.0	....	.08	....	.42	0	.19	.08	3.70	....	....	....
18	133	.517	58.2	....	....	33.0	36.5	....	.03	....	.26	0	.04	.05	3.70	....	....	....
19	239	.214	39.2	....	....	35.5	39.5	....	.09	....	.29	0	.07	.01	3.70	....	....	5.9
20	190	.181	40.2	....	....	38.0	41.0	....	....	....	.15	0	0	.04	3.70	....	....	....
21	344	.239	43.0	....	....	38.0	42.0	....	.12	....	.05	0	.03	0	3.70	....	....	....
22	37	.201	44.5	....	....	38.0	45.0	....	....	....	0	0	.02	0	.85	....	....	....
23	202	.141	36.0	....	....	39.0	42.5	....	....	....	0	0	0	0	0	....	....	....
24	260	.113	32.5	....	....	38.5	42.0	....	....	....	0	2.50	0	0	0	....	....	....
25	240	.197	41.0	....	....	38.5	42.5	....	.05	....	0	2.68	0	0	0	....	....	....
26	131	.172	35.8	....	....	38.0	43.5	....	....	....	0	1.10	0	0	0	....	....	5.7
27	298	.169	42.2	....	....	38.5	42.5	....	.12	....	0	1.30	0	0	.05	....	....	....
28	167	.121	33.8	....	....	39.0	43.0	....	....	....	.05	2.60	.02	.03	.80	....	....	....
29	293	.156	31.0	....	....	37.0	38.5	....	.37	....	.05	3.70	.02	0	3.70	....	....	....
30	311	.206	35.5	....	....	37.5	38.0	....	.20	....	.05	3.70	.01	.01	3.70	....	....	....

* Snow.

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of May, 1909.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE. 2 inches depth.	24 inches depth.	Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.* 1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.* Snow.	Water.	Depth to water in well. *Feet.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	193	.188	26.2	......	......	39.0	38.0	......	.95	......	.60	0	.05	0	3.70	......	......	......
2	222	.155	36.8	......	......	38.0	38.0	......	.05	......	2.80	0	.50	.16	3.70	......	......	......
3	167	.197	41.8	......	......	38.0	38.0	......	.11	......	3.70	0	1.75	.88	3.70	......	......	4.8
4	120	.203	45.2	......	......	43.0	38.0	......	......	......	.58	0	.16	.16	3.70	......	......	......
5	171	.302	56.8	......	......	44.5	38.5	......	.02	......	.47	0	0	0	3.70	......	......	......
6	254	.433	61.2	......	......	45.5	39.5	......	.22	......	.18	0	.02	.03	3.70	......	......	......
7	121	.386	53.2	......	......	46.0	40.0	......	.05	.11	.27	0	.04	.03	3.70	......	......	......
8	259	.367	53.8	......	......	41.5	40.5	......	......	.08	0	0	0	0	3.70	......	......	......
9	200	.434	64.5	......	......	51.0	45.5	......	.11	.17	0	0	0	0	3.70	......	......	......
10	177	.388	55.0	......	......	53.5	45.0	......	.52	.24	0	0	0	0	3.70	......	......	5.0
11	182	.214	44.5	......	......	51.0	43.5	......	.01	.09	0	0	0	0	3.70	......	......	......
12	137	.203	50.8	......	......	45.5	47.0	......	......	.12	0	0	0	.03	3.70	......	......	......
13	137	.352	60.0	......	......	65.5	45.5	......	.12	.07	.23	0	.08	.05	3.70	......	......	......
14	147	.453	58.8	......	......	56.0	46.0	......	.15	.07	.37	0	.08	.06	3.70	......	......	......
15	172	.412	59.5	......	......	59.5	47.5	......	.40	.15	.03	0	.09	.24	.02	......	......	......
16	84	.381	60.0	......	......	57.0	48.0	......	.27	.09	.04	0	.06	0	.13	......	......	......
17	122	.311	48.8	......	......	51.5	48.0	......	.15	?	.02	0	.05	.15	.03	......	......	5.2
18	114	.344	51.0	......	......	49.5	48.0	......	.02	.12	.06	0	.04	.05	.04	......	......	......
19	56	.354	59.8	......	......	53.5	48.0	......	......	.06	.03	0	.13	.08	.58	......	......	......
20	184	.331	53.2	......	......	55.0	48.0	......	......	.16	.10	0	.10	.08	2.90	......	......	......
21	204	.269	49.5	......	......	49.5	48.0	......	......	.12	.06	1.20	.02	.02	.01	......	......	......
22	181	.266	47.2	......	......	53.0	48.0	......	......	.10	0	.01	.01	.01	0	......	......	......
23	86	.298	49.8	......	......	48.5	48.0	......	......	.16	0	0	0	.01	0	......	......	......
24	165	.260	52.8	......	......	54.0	48.0	......	......	.13	0	0	0	0	0	......	......	5.6
25	106	.250	56.5	......	......	54.0	48.5	......	......	.25	0	0	0	0	0	......	......	......
26	106	.316	62.0	......	......	56.5	49.0	......	......	.16	0	0	0	0	0	......	......	......
27	149	.472	59.5	......	......	57.0	49.5	......	.40	0	0	0	0	0	0	......	......	......
28	124	.471	59.8	......	......	57.5	50.0	......	.13	.03	0	0	0	0	0	......	......	......
29	148	.356	56.8	......	......	57.5	50.0	......	......	.13	0	0	0	0	0	......	......	......
30	159	.291	57.5	......	......	56.5	50.0	......	......	.19	0	0	0	0	0	......	......	......
31	159	.283	61.8	......	......	58.5	50.5	......	......	.25	0	0	.02	0	0	......	......	5.8

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of June, 1909.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	102	.318	58.8			59.5	51.5			.24	0	0	0	0	0			
2	62	.398	64.8			58.0	52.0			.06	.01	0	.01	0	0			
3	139	.430	66.5			58.0	52.0			.19	.01	0	.01	0	0			
4	195	.471	59.2			60.0	52.5		.85	.38	0	0	0	0	0			
5	97	.499	59.2			59.0	53.0		.42		0	0	0	0	.06			
6	104	.395	57.2			58.5	53.0			.10	0	0	0	0	0			
7	64	.301	62.2			56.0	53.0			.11	0	0	0	0	0			7.8
8	89	.306	57.2			57.0	53.0			.28	0	0	0	0	0			
9	150	.399	53.8			59.0	54.0			.06	0	0	0	0	0			
10	119	.438	55.5			56.0	54.0		.60		0	0	0	0	0			
11	102	.410	58.2			59.5	54.0			.10	0	0	0	0	0			
12	118	.417	67.8			62.0	54.0			.15	0	0	0	0	.05			
13	165	.603	65.5			60.0	54.0		.40		0	0	0	0	0			
14	172	.563	63.5			62.5	55.0			.05	0	0	0	0	0			8.0
15	116	.321	57.8			61.5	55.5			.20	0	0	0	0	.02			
16	142	.410	65.0			60.5	56.0			.22	0	.01	0	0	0			
17	157	.410	57.8			62.5	56.0		.95	.08	0	0	0	0	0			
18	157	.212	51.0			58.5	56.0			.11	0	0	0	0	.02			
19	174	.305	64.0			57.0	56.0			.20	0	0	0	0	.05			
20	116	.410	70.2			61.0	56.0			.12	0	0	0	0	0			
21	104	.537	74.0			63.5	56.0			.10	0	0	0	0	0			8.2
22	90	.710	72.8			66.0	56.0			.10	0	0	0	0	0			
23	89	.679	75.5			66.5	57.0			.10	0	0	0	0	0			
24	78	.682	75.8			65.5	57.5			.10	0	0	0	0	0			
25	72	.636	73.2			67.0	58.0		.11	.07	0	0	0	0	0			
26	102	.516	73.7			68.0	58.0			.15	0	0	0	0	0			
27	85	.606	73.2			68.0	60.0		.25	.15	0	0	0	0	0			
28	85	.538	70.2			65.5	60.0		.05	.20	0	0	0	0	.03			8.5
29	98	.390	65.2			69.5	61.0			.20	0	0	0	0	0			
30	96	.477	70.8			65.5	61.0			.20	0	0	0	0	0			

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of July, 1909.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1........	128	.453	66.8	....	....	68.5	61.0	....	....	.18	0	0	0	0	0	....	....	....
2........	141	.423	58.5	....	....	65.5	61.0	....	.56	.18	0	0	0	0	0	....	....	....
3........	249	.358	56.2	....	....	63.5	61.0	....	....	.18	0	0	0	0	0	....	....	....
4........	135	.349	62.0	....	....	61.0	59.5	....	....	.14	0	0	0	0	0	....	....	....
5........	111	.350	60.2	....	....	62.5	59.5	....	....	.15	0	0	0	0	0	....	....	8.6
6........	70	.368	61.0	....	....	64.0	59.5	....	....	.16	0	0	0	0	0	....	....	....
7........	83	.327	59.8	....	....	62.0	60.0	....	....	.16	0	0	0	0	0	....	....	....
8........	132	.329	59.8	....	....	65.0	60.0	....	....	.26	0	0	0	0	0	....	....	....
9........	100	.384	61.8	....	....	65.5	60.5	....	....	.18	0	0	0	0	0	....	....	....
10........	187	.464	69.8	....	....	65.5	60.0	....	....	.16	0	0	0	0	0	....	....	....
11........	126	.610	69.8	....	....	66.0	60.0	....	.06	.15	0	0	0	0	0	....	....	....
12........	173	.626	74.8	....	....	68.0	60.5	....	....	.10	0	0	0	0	0	....	....	10.0
13........	149	.572	67.5	....	....	69.0	61.0	....	....	0	0	0	0	0	0	....	....	....
14........	65	.508	67.5	....	....	70.0	61.5	....	....	....	0	0	0	0	0	....	....	....
15........	117	.575	68.8	....	....	68.5	62.0	....	.13	.29	0	0	0	0	0	....	....	....
16........	86	.596	67.5	....	....	66.0	62.0	....	.07	....	0	0	0	0	0	....	....	....
17........	151	.464	61.8	....	....	63.0	62.0	....	....	....	0	0	0	0	0	....	....	....
18........	186	.377	58.8	....	....	62.0	62.0	....	.22	.25	0	0	0	0	0	....	....	....
19........	107	.419	55.5	....	....	64.0	62.0	....	.09	.19	0	0	0	0	0	....	....	12.6
20........	77	.413	63.2	....	....	64.5	62.0	....	....	.18	0	0	0	0	0	....	....	....
21........	53	.374	62.5	....	....	63.0	61.0	....	....	....	0	0	0	0	0	....	....	....
22........	117	.435	61.5	....	....	64.5	61.0	....	.40	.12	0	0	0	0	0	....	....	....
23........	154	.446	58.2	....	....	63.5	61.0	....	1.46	.11	0	0	0	0	0	....	....	....
24........	472	.432	55.5	....	....	62.5	61.0	....	.45	.28	0	0	0	0	0	....	....	....
25........	663	.429	62.0	....	....	63.5	61.0	....	.03	.18	0	0	0	0	0	....	....	....
26........	77	.483	66.5	....	....	64.5	61.5	....	....	.10	0	0	0	0	0	....	....	14.0
27........	89	.535	71.0	....	....	67.0	62.0	....	....	.11	0	0	0	0	0	....	....	....
28........	154	.569	75.8	....	....	68.5	63.0	....	....	.12	0	0	0	0	0	....	....	....
29........	82	.768	74.8	....	....	70.0	63.5	....	.32	.04	0	0	0	0	0	....	....	....
30........	106	.642	70.0	....	....	66.0	64.0	....	....	.18	0	0	0	0	0	....	....	....
31........	54	.527	65.5	....	....	63.5	63.5	....	....	.12	.15	?	0	0	.14	....	....	....

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of August, 1909.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE. 2 inches depth.	MEAN SOIL TEMPERATURE. 24 inches depth.	Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.* 1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.* Snow.	Water.	Depth to water in well. *Feet.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	66	.425	67.8	....	....	68.0	63.5	....	....	.15	0	0	0	0	0	....	....	....
2	104	.365	66.5	....	....	68.0	63.5	....	....	.16	0	0	0	0	0	....	....	14.2
3	86	.505	73.5	....	....	67.0	64.0	....	....	.18	0	0	0	0	0	....	....	....
4	69	.416	66.8	....	....	67.0	64.0	....	....	.06	0	0	0	0	0	....	....	....
5	92	.386	82.5	....	....	64.5	64.0	....	....	.11	0	0	0	0	0	....	....	....
6	46	.563	64.8	....	....	67.0	64.0	....	.03	.13	0	0	0	0	0	....	....	....
7	73	.638	72.8	....	....	66.5	64.0	....	....	.08	0	0	0	0	0	....	....	....
8	78	.582	73.0	....	....	69.0	64.0	....	....	.09	0	0	0	0	0	....	....	....
9	127	.563	70.0	....	....	76.0	64.0	....	.03	.15	0	0	0	0	0	....	....	14.6
10	118	.427	65.0	....	....	69.0	64.0	....	....	.15	0	0	0	0	0	....	....	....
11	52	.442	67.8	....	....	66.0	65.0	....	....	.10	0	0	0	0	0	....	....	....
12	125	.402	67.2	....	....	65.5	65.0	....	....	.15	0	0	0	0	0	....	....	....
13	103	.490	64.5	....	....	67.5	65.0	....	....	.17	0	0	0	0	0	....	....	....
14	152	.460	67.8	....	....	67.5	65.0	....	....	.10	0	0	0	0	0	....	....	....
15	182	.449	59.5	....	....	66.5	65.0	....	2.03	.93	0	0	0	0	0	....	....	....
16	250	.448	56.0	....	....	58.5	65.0	....	.72	.32	0	0	0	0	0	....	....	15.0
17	70	.454	56.5	....	....	60.0	65.0	....	.17	....	0	0	0	0	0	....	....	....
18	84	.517	61.2	....	....	62.0	63.0	....	.20	.19	0	0	0	0	0	....	....	....
19	130	.507	64.8	....	....	64.0	63.0	....	....	.10	0	0	0	0	0	....	....	....
20	89	.423	61.5	....	....	63.0	62.0	....	.26	.11	0	0	0	0	0	....	....	....
21	82	.413	62.8	....	....	63.0	62.0	....	....	.12	0	0	0	0	0	....	....	....
22	73	.375	62.5	....	....	62.0	62.0	....	....	.10	0	0	0	0	0	....	....	....
23	79	.448	69.0	....	....	63.5	62.0	....	....	.11	0	0	0	0	0	....	....	15.5
24	80	.565	74.5	....	....	65.5	62.0	....	....	.11	0	0	0	0	0	....	....	....
25	108	.563	79.5	....	....	68.5	62.0	....	....	.15	0	0	0	0	0	....	....	....
26	136	.491	70.8	....	....	69.0	62.0	....	.05	.11	0	0	0	0	0	....	....	....
27	119	.384	63.0	....	....	64.0	62.0	....	....	.08	0	0	0	0	0	....	....	....
28	111	.502	67.0	....	....	64.5	62.0	....	....	.10	0	0	0	0	0	....	....	....
29	128	.538	63.5	....	....	65.0	62.5	....	.25	.28	0	0	0	0	0	....	....	....
30	120	.326	49.5	....	....	62.5	63.0	....	....	.08	0	0	0	0	0	....	....	....
31	214	.340	58.2	....	....	59.5	62.0	....	.10	.20	0	0	0	0	0	....	....	

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of September, 1909.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	181	.329	50.5	......	......	60.0	62.0	......	.05	.15	0	0	0	0	0	......	......	......
2	135	.267	53.5	......	......	57.0	61.5	......	......	.08	0	0	.02	0	0	......	......	......
3	113	.365	64.5	......	......	59.0	60.5	......	......	.10	.04	0	0	0	0	......	......	......
4	190	.440	61.5	......	......	60.0	60.0	......	.33	......	0	0	0	0	.02	......	......	......
5	150	.378	53.2	......	......	58.5	60.0	......	.10	.02	.03	0	0	0	0	......	......	......
6	123	.306	55.5	......	......	58.0	60.0	......	......	.06	.01	0	0	0	0	......	......	15.9
7	72	.331	53.0	......	......	56.5	60.9	......	......	.15	0	0	0	0	0	......	......	......
8	51	.355	53.2	......	......	54.0	59.0	......	......	.10	0	0	0	0	.05	......	......	......
9	150	.431	61.0	......	......	60.0	59.0	......	......	......	.01	0	.03	0	0	......	......	......
10	114	.459	56.8	......	......	60.0	59.0	......	.63	.77	0	0	0	0	.05	......	......	......
11	76	.408	57.2	......	......	60.0	59.0	......	......	.12	0	0	0	0	0	......	......	......
12	132	.454	59.5	......	......	56.5	59.0	......	......	.08	0	0	0	0	0	......	......	......
13	85	.503	64.5	......	......	63.0	59.0	......	......	.01	0	0	0	0	.21	......	......	16.0
14	95	.421	54.0	......	......	65.0	59.0	......	......	.04	0	0	0	0	0	......	......	......
15	170	.568	64.0	......	......	64.5	59.5	......	.12	.02	0	0	0	0	0	......	......	......
16	54	.438	57.8	......	......	64.0	60.0	......	.02	.10	0	0	0	0	0	......	......	......
17	71	.357	55.5	......	......	62.5	61.0	......	......	.08	0	0	.02	0	0	......	......	......
18	124	.286	52.8	......	......	60.0	60.5	......	......	.10	0	0	0	0	0	......	......	......
19	72	.308	57.2	......	......	58.0	60.0	......	......	.07	0	0	0	0	0	......	......	......
20	167	.354	54.5	......	......	58.0	60.0	......	......	.05	0	0	0	0	0	......	......	16.3
21	150	.412	57.8	......	......	58.5	60.0	......	......	.08	0	0	.01	0	0	......	......	......
22	177	.563	67.0	......	......	59.5	59.0	......	......	.15	0	0	0	0	0	......	......	......
23	180	.543	68.0	......	......	64.0	59.0	......	.47	.17	0	0	0	0	0	......	......	......
24	114	.315	50.2	......	......	62.0	59.0	......	......	.07	.01	0	.01	0	0	......	......	......
25	64	.276	51.8	......	......	59.5	59.5	......	......	.10	0	0	0	0	0	......	......	......
26	55	.309	54.5	......	......	56.5	59.5	......	......	.08	0	0	0	0	0	......	......	......
27	111	.365	52.2	......	......	56.0	59.0	......	.33	......	0	0	0	0	0	......	......	16.6
28	96	.242	45.2	......	......	55.0	58.0	......	......	.03	0	0	0	0	0	......	......	......
29	139	.306	50.2	......	......	53.5	57.5	......	......	.06	0	0	0	0	0	......	......	......
30	121	.300	49.0	......	......	51.5	57.0	......	.25	.15	0	0	0	0	0	......	......	......

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of October, 1909.

DAY.	Total wind movement. 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	170	.206	45.2			57.5	57.0		.12	.04	0	0	0	0	0			
2	182	.327	49.0			50.0	57.0		.03	0	0	0	0	0	0			
3	78	.325	48.8			52.0	57.0			.05	0	0	0	0	.07			
4	40	.292	45.8			51.5	56.0			.07	0	0	0	0	0			16.2
5	61	.307	49.2			51.0	56.0			.08	0	.09	0	0	.01			
6	80	.309	48.0			52.0	55.5			.04	0	0	0	0	0			
7	75	.348	54.5			52.0	55.0			.07	0	0	0	0	0			
8	52	.401	58.2			51.5	55.5			.05	0	0	0	0	0			
9	62	.439	61.2			51.5	56.0			.06	0	0	0	0	0			
10	106	.396	61.8			57.5	56.0			.04	.02	0	0	0	0			
11	140	.348	57.8			57.5	56.0		.55	.25	0	0	0	0	0			16.2
12	128	.188	41.5			53.0	56.0			.04	0	0	0	0	0			
13	170	.122	34.2			49.5	55.0			.03	0	0	0	0	0			
14	190	.169	41.5			44.5	55.0		.02	.10	.01	.01	0	0	.03			
15	139	.197	40.0			48.0	54.0			.06	0	.01	0	0	0			
16	171	.221	39.8			43.0	54.0		.45	.05	0	.02	0	0	0			
17	171	.213	37.8			44.5	53.0		.05		0	0	0	0	.01			
18	110	.200	35.0			44.5	53.0		.31	.04	.04	0	0	0	0			16.3
19	107	.181	36.5			43.5	52.0			.05	0	0	0	0	0			
20	125	.178	33.2			41.5	51.0			.03	0	0	0	0	.05			
21	203	.259	43.8			41.5	50.0		.35	.05	.02	0	0	0	0			
22	155	.271	44.0			43.5	50.0		.19		.08	0	0	0	0			
23	65	.221	38.2			44.5	50.0		.24		.01	0	0	0	0			
24	128	.176	33.8			44.5	50.0		.10	.18	0	.04	0	0	.02			
25	155	.177	36.5			42.5	50.0			.10	.01	0	0	0	.01			16.3
26	165	.214	43.8			42.0	50.0				.05	0	0	0	.03			
27	151	.221	45.0			41.0	49.0		.05	.04	0	0	0	0	.01			
28	693	.133	32.0			42.5	48.5		.02		.05	.02	0	0	.02			
29	540	.099	28.5			40.0	48.0			0	.03	.02	0	0	.01			
30	151	.125	37.8			37.5	47.0			.06	.01	.01	0	0	.27			
31	83	.215	51.5			39.0	47.0			.05	0	0	0	0	.02			

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of November, 1909.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	150	.245	53.0			44.0	46.0			.08	0	0	0	0	0			16.4
2	165	.296	51.0			49.0	46.0			.02	0	0	0	0	0			
3	132	138	45.8			54.0	46.0		.05	.11	0	0	0	0	0			
4	180	.108	43.5			48.0	46.0			?	0	0	0	0	0			
5	172	.083	39.8			44.5	46.0			.04	0	.10	0	0	0			
6	135	.059	35.8			36.5	46.0		.04	.07	0	0	0	.01	0			
7	155	.075	34.2			35.5	46.0		.02	?	.03	.01	0	0	0			
8	125	.120	39.2			41.5	46.0		.42	.26	0	0	0	0	0			16.6
9	145	.129	34.5			40.5	46.0			.01	0	0	0	.03	.01			
10	156	.210	41.0			41.0	46.0			.03	.03	.06	0	.06	0			
11	154	.313	52.8			44.0	46.0			.05	.06	0	0	0	0			
12	118	.363	52.5			46.5	46.0			.04	.06	.01	0	0	0			
13	115	.366	51.2			47.0	46.0			.04	0	.01	.01	0	0			
14	165	361	51.8			47.5	46.0			.02	0	.02	0	0	0			
15	218	.237	43.0			47.5	46.0		.04	.07	.01	0	.30	0	0			16.5
16	187	.201	36.5			46.0	46.5		.39	.32	0	0	.10	0	0			
17	256	.163	34.0			45.5	47.0		.02		.13	.01	.10	0	0			
18	178	.111	26.8			45.0	46.5		*.02		.01	0	.03	.02	0			
19	221	134	32.5			45.5	46.0		*.01		.02	.05	.11	0	0			
20	257	.163	48.2			45.0	46.0		.04		0	.30	.06	.01	0			
21	165	230	45.5			46.5	46.0				0	.05	.05	0	0			
22	287	262	49.0			47.5	46.0		.10		0	.05	.02	0	0			16.2
23	176	.123	23.0			47.0	46.0		.01		.57	0	.02	.01	0			
24	134	.105	21.2			43.0	45.5		*.72		.30	.10	.11	0	0			
25	256	.105	23.2			39.0	45.0		.13		1.30	2.75	.17	.02	0			
26	144	.209	57.2			36.5	45.0				3.75	0	.07	0	0			
27	107	.114	29.2			36.0	45.0				0	0	.14	.01	.01			
28	161	128	40.8			38.5	45.0				0	0	.37	0	0			
29	165	.100	25.2			37.5	42.0				.05	.03	.03	.02	.01			16.0
30	103	.080	22.2			38.5	41.0				0	0	0	0	0			

* Snow.

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of December, 1909.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE. 2 inches depth.	MEAN SOIL TEMPERATURE. 24 inches depth.	Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.* 1 Clay, long grass.	PERCOLATION THROUGH LYSIMETER. *Inches.* 2 Clay, short grass.	PERCOLATION THROUGH LYSIMETER. *Inches.* 3 Clay and loam, bare.	PERCOLATION THROUGH LYSIMETER. *Inches.* 4 Sand, long grass.	PERCOLATION THROUGH LYSIMETER. *Inches.* 5 Sand, bare.	ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.* Snow.	ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.* Water.	Depth to water in well. *Feet.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	126	.080	23.8	....	....	39.0	41.0	....	....	....	0	0	0	0	0	....	....	....
2	101	.111	27.5	....	....	40.0	42.0	....	....	....	0	.01	0	0	0	....	....	....
3	103	.154	31.5	....	....	40.0	42.0	....	....	....	.10	.01	0	0	0	....	....	....
4	172	.177	31.8	....	....	41.5	42.0	....	.01	....	0	0	0	0	0	....	....	....
5	100	.157	34.0	....	....	38.5	40.0	....	....	....	0	0	0	0	0	....	....	....
6	148	.128	34.0	....	....	39.5	40.0	....	....	....	0	.01	0	0	0	....	....	15.8
7	172	.145	30.8	....	....	39.5	40.0	....	.20	....	.05	0	0	.01	0	....	....	....
8	177	.094	19.0	....	....	36.5	40.0	....	*.02	....	0	.03	.01	0	0	....	....	....
9	228	.074	19.5	....	....	29.5	40.0	....	*.02	....	0	0	0	0	0	....	....	....
10	261	.083	15.0	....	....	27.5	39.0	....	....	....	0	.01	.01	0	0	....	....	....
11	161	.092	19.2	....	....	27.5	39.0	....	....	....	0	0	0	0	0	....	....	....
12	227	.076	15.5	....	....	26.0	39.0	....	.91	....	0	.05	0	0	0	....	....	....
13	112	.127	27.0	....	....	24.0	38.0	....	*.01	....	0	0	0	0	0	....	....	13.8
14	287	.145	32.5	....	....	26.5	37.0	....	*.02	....	.15	0	0	0	0	....	....	....
15	196	.127	28.5	....	....	27.5	37.0	....	*.04	....	0	0	0	0	0	....	....	....
16	257	.110	24.0	....	....	26.5	36.0	....	*.09	....	0	0	0	0	.01	....	....	....
17	210	.102	24.8	....	....	23.5	36.0	....	*.01	....	0	0	0	0	0	....	....	....
18	150	.095	21.8	....	....	22.5	35.0	....	....	....	.05	.03	0	0	0	....	....	....
19	226	.076	19.5	....	....	21.0	34.0	....	....	....	.10	.01	0	0	0	....	....	....
20	209	.070	17.5	....	....	17.0	34.0	....	*.02	....	.10	.02	0	0	0	....	....	12.0
21	173	.059	18.8	....	....	18.5	34.0	....	*.14	....	0	0	.01	0	0	....	....	....
22	168	.102	21.8	....	....	20.0	33.0	....	....	....	0	.01	0	0	0	....	....	....
23	263	.100	24.2	....	....	24.5	33.0	....	....	....	0	0	0	0	0	....	....	....
24	290	(9)	19.8	....	....	22.0	32.0	....	*.19	....	0	0	0	0	0	....	....	....
25	116	.093	19.5	....	....	20.5	32.0	....	*.09	....	0	.05	0	0	.01	....	....	....
26	230	.082	16.8	....	....	20.0	31.0	....	*.01	....	.15	0	0	0	0	....	....	....
27	224	.074	15.5	....	....	18.0	31.0	....	*.04	....	.05	0	0	0	0	....	....	12.4
28	133	.069	14.2	....	....	16.5	30.0	....	*.01	....	.10	.01	0	0	0	....	....	....
29	162	.045	5.0	....	....	11.0	29.0	....	....	....	0	0	0	0	0	....	....	....
30	255	.039	3.2	....	....	11.5	28.0	....	....	....	0	0	0	0	0	....	....	....
31	211	.050	12.5	....	....	15.5	28.0	....	....	....	.30	.71	.79	.55	1.01	....	....	....

* Snow.

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of January, 1910.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	317	.134	29.8			19.5	28.0				.01	.31	0	0	.10			
2	238	.136	26.0			23.0	28.0		* .04	.17	0	.06	0	0	0			
3	362	.077	18.5			24.5	28.0		* .02	.02	.02	0	0	0	0			14.6
4	218	.048	9.0			20.5	28.0				0	.02	0	0	.02			
5	270	.101	23.5			18.0	28.5		1.05	1.05	0	0	0	0	.01			
6	170	.099	23.5			18.0	29.0		* .40	.40	.01	.02	0	0	.01			
7	213	.073	16.5			18.0	28.5		* .01	.01	.06	0	0	0	0			
8	180	.065	17.0			18.5	28.0		* .05	.05	0	0	0	0	0			
9	90	.079	21.0			19.0	27.0			.13	.02	0	0	0	.04			
10	159	.065	10.2			19.0	27.0				.01	0	0	0	0			14.5
11	139	.059	16.0			18.0	27.0				.05	.12	0	0	0			
12	43	.084	22.0			18.0	28.0				.07	.01	0	0	.02			
13	198	.088	17.2			18.0	28.0		* .01	.01	.01	0	0	0	.02			
14	303	.069	14.0			18.0	28.0		* .09	.09	.01	.03	0	0	0			
15	155	.063	12.5			18.0	28.0				.19	.02	0	0	0			
16	46	.065	13.8			18.0	27.0			.15	.02	.01	0	0	0			
17	170	.120	22.0			17.5	27.0		* .04	.04	.01	0	0	0	.08			14.4
18	406	.188	35.0			17.0	27.0		.29	.29	.07	.01	0	.03	.10			
19	168	.108	26.5			17.5	27.0				.02	.01	0	.01	.08			
20	224	.132	34.8			18.0	28.0				.12	.09	0	.01	.08			
21	381	.161	40.8			19.0	28.0		.27	.27	.13	.10	0	0	.24			
22	399	.069	31.0			19.0	29.5				.20	3.10	0	.06	2.95			
23	152	.100	36.5			18.0	32.0			.11	3.40	0	0	0	0			
24	155	.155	35.2			18.0	33.5		* .01	.01	0	0	0	0	0			14.7
25	170	.091	19.5			19.5	34.0				0	0	0	0	0			
26	207	.124	23.2			21.5	33.0		* .01	.01	0	0	0	0	0			
27	258	.199	37.8			22.5	33.0		* .25	.25	0	0	0	0	0			
28	147	.111	25.8			23.0	34.0		* .02	.02	0	0	0	0	0			
29	335	.108	21.8			23.0	34.0		* .32	.82	0	0	0	0	0			
30	125	.108	22.0			23.0	34.0		* .03	.20	0	0	0	0	0			
31	88	.096	20.0			23.0	34.0				.05	.02	.19	.19	.03			14.6

* Snow.

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of February, 1910.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	113	.077	18.0	......	......	21.0	30.0	......	......	......	0	0	.01	.02	0	......	......	......
2	202	.096	24.2	......	......	21.0	30.0	......	*.12	.12	0	0	0	0	0	......	......	......
3	206	.120	23.0	......	......	21.0	30.0	......	*.35	.35	0	.01	0	0	0	......	......	......
4	240	.103	24.2	......	......	21.0	30.0	......	......	......	0	0	0	0	0	......	......	......
5	251	.067	12.5	......	......	21.0	30.5	......	*.09	.09	.01	0	.09	0	0	......	......	......
6	210	.041	7.5	......	......	21.0	31.0	......	......	......	0	0	0	0	0	......	......	......
7	184	.048	11.5	......	......	21.0	31.0	......	......	......	0	.01	0	0	0	......	......	7.8
8	257	.095	30.0	......	......	21.5	31.0	......	......	......	0	0	0	0	0	......	......	......
9	244	.135	28.5	......	......	22.0	31.0	......	*.12	.12	0	0	.02	0	0	......	......	......
10	259	.061	13.2	......	......	22.0	31.0	......	......	......	0	0	0	0	.03	......	......	......
11	182	.057	12.5	......	......	22.0	31.0	......	*.25	.25	0	0	.01	.01	0	......	......	......
12	335	.086	17.2	......	......	20.0	31.0	......	*.25	.25	0	.18	0	0	.02	......	......	......
13	240	.091	20.0	......	......	20.0	31.0	......	*.06	......	.02	.10	0	0	0	......	......	......
14	190	.096	23.5	......	......	20.0	31.0	......	......	......	.02	.05	0	0	.09	......	......	6.0
15	385	.146	30.5	......	......	20.0	31.0	......	*.02	.02	0	.06	0	.01	0	......	......	......
16	105	.117	23.0	......	......	20.0	31.0	......	*.12	.12	.08	.19	.02	0	.01	......	......	......
17	263	.068	12.8	......	......	20.0	31.0	......	*.40	.40	.03	2.90	.01	0	.02	......	......	......
18	167	.044	7.0	......	......	20.0	30.0	......	......	......	.02	0	.02	0	.40	......	......	......
19	209	.057	15.2	......	......	20.0	30.0	......	......	......	.07	0	.03	0	.20	......	......	......
20	167	.146	30.2	......	......	21.0	30.0	......	*.10	......	.06	0	.07	.01	.26	......	......	......
21	129	.196	35.0	......	......	21.0	30.0	......	*.01	.01	.16	0	.04	0	2.80	......	......	5.8
22	230	.091	17.8	......	......	19.0	30.0	......	......	......	0	0	0	0	.10	......	......	......
23	240	.049	8.8	......	......	19.0	30.0	......	*.40	.45	0	0	0	0	.10	......	......	......
24	107	.032	4.0	......	......	19.0	28.0	......	......	......	0	.10	.02	.05	.05	......	......	......
25	145	.046	9.8	......	......	19.5	28.0	......	......	......	.37	.70	.06	.02	.35	......	......	......
26	365	.106	30.5	......	......	20.0	31.0	......	.13	.13	2.81	2.90	.50	.48	3.10	......	......	......
27	225	.219	42.0	......	......	20.0	32.0	......	1.02	.83	3.70	0	2.80	3.10	3.70	......	......	......
28	86	.231	38.2	......	......	20.5	32.0	......	.18	.18	3.70	0	3.70	3.70	3.70	......	......	5.7

* Snow.

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of March, 1910.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	167	.222	37.5			21.0	32.0		.05		3.70	0	1.25	3.70	3.70			
2	149	.190	36.5			22.0	32.0				3.70	0	.50	.50	3.70			
3	168	122	32.5			22.5	32.5				3.70	0	.39	.40	3.70			
4	135	.125	33.8			23.0	33.0				3.70	0	.21	.18	3.70			
5	132	.184	45.8			23.0	33.0				3.70	0	.48	.52	3.70			
6	244	167	39.8			23.0	33.0		.45	.39	3.70	0	1.52	3.18	3.70			
7	267	.189	38.0			22.5	33.0		.02		3.70	0	.43	.78	3.70			5.6
8	140	.115	26.0			22.0	33.0		.03		.65	0	.15	.17	3.70			
9	190	.085	26.2			22.0	33.0				.25	0	.05	.10	3.70			
10	50	.081	22.5			22.0	33.0				.07	0	.02	.02	3.70			
11	110	.099	25.0			22.0	33.0				.07	0	.08	0	3.70			
12	177	.118	32.5								.08	0	.02	.03	3.70			
13	226	142	31.5						.24		.69	0	.07	.04	3.70			
14	298	.082	15.2						.01		.16	0	.04	.01	3.70			5.7
15	163	.092	17.2								.11	0	.04	0	3.70			
16	171	.095	24.8								.05	0	0	0	2.65			
17	161	.055	15.0								0	2.60	0	0	.03			
18	133	.095	23.8								.03	1.75	0	0	0			
19	118	.189	35.8								2.77	0	0	0	3.67			
20	303	.183	36.5						.18		2.95	0	1.00	1.80	3.70			
21	175	.114	34.5								.95	0	.12	.32	3.70			5.5
22	150	.169	41.5								.15	0	.13	.23	3.70			
23	110	.180	42.0								.05	0	.08	.11	3.70			
24	258	.233	59.5								.06	0	.07	.12	3.70			
25	282	.202	43.5								.03	0	.04	.04	3.70			
26	179	.194	37.2								.03	1.85	.03	.03	3.70			
27	117	.250	46.5								.02	.01	.03	0	3.70			
28	216	.237	55.2								.01	.02	.01	.01	.02			5.4
29	126	.295	56.5								.02	.02	.01	.01	0			
30	159	.378	60.0						.02		0	0	0	0	0			
31	177	.251	46.0						.07		0	0	0	0	0			

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of April, 1910.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	100	.223	39.0	...	...	...	...	...	...	...	0	0	0	0	.01	...	...	...
2	100	.204	43.2	...	...	...	...	...	...	...	.01	.01	.01	0	.03	...	...	...
3	183	.211	48.5	...	...	...	...	...	...	...	0	0	0	0	0	...	...	...
4	126	.339	49.8	...	...	46.0	41.0	...	.12	...	0	0	0	0	0	...	...	6.8
5	101	.400	65.0	...	...	47.0	44.5	...	...	...	.04	.02	.02	0	.01	...	...	...
6	180	.310	54.2	...	...	53.0	42.5	...	.30	...	.01	.01	0	0	.03	...	...	...
7	243	.172	30.8	...	...	43.5	43.5	...	.04	...	0	0	0	.01	0	...	...	...
8	188	.158	31.5	...	...	40.5	40.5	...	.01	...	0	.01	0	0	0	...	...	...
9	155	.182	38.8	...	...	38.0	42.0	...	.05	...	0	0	0	0	0	...	...	...
10	172	.139	37.8	...	...	38.0	41.0	...	...	...	.02	0	0	0	.05	...	...	...
11	10	.160	32.5	...	...	35.5	41.0	...	.35	...	0	0	0	0	.07	...	...	6.7
12	150	.131	34.0	...	...	38.0	40.0	...	...	.05	0	0	0	.26	.08	...	...	...
13	160	.129	42.0	...	...	38.5	40.0	...	...	.14	0	.01	.02	.35	.32	...	...	...
14	119	.177	48.0	...	...	40.5	40.0	...	...	.10	.01	.04	.02	.10	.16	...	...	...
15	102	.185	48.8	...	...	42.5	40.5	...	...	.09	0	.04	.01	.05	.10	...	...	...
16	371	.147	48.0	...	...	46.5	41.0	...	...	.14	.02	.01	.01	.02	.03	...	...	...
17	398	.237	43.5	...	...	40.5	41.5	...	.13	.21	.02	.02	.01	0	.05	...	...	...
18	203	.353	52.0	...	...	45.0	41.5	...	.37	...	.01	0	0	.01	.02	...	...	6.7
19	200	311	48.0	...	...	48.0	42.0	...	.04	.02	.01	.01	.01	.07	.01	...	...	...
20	124	.206	41.5	...	...	46.5	42.5	...	...	.06	.02	.04	.02	.05	.14	...	...	...
21	139	.265	44.2	...	...	46.0	44.0	...	.07	.04	.03	.03	.05	.04	.05	...	...	...
22	140	.269	49.5	...	...	47.5	44.0	...	...	.07	.01	.01	.02	.01	.03	...	...	...
23	256	.294	54.2	...	...	49.0	44.0	...	...	.05	.02	.01	0	0	.02	...	...	...
24	277	.376	58.2	...	...	48.5	45.0	...	...	.05	0	.01	0	0	.01	...	...	...
25	344	.393	53.8	...	...	50.0	45.0	...	.87	.33	.15	.02	0	.02	.01	...	...	6.5
26	194	.291	48.8	...	...	53.0	46.5	...	...	...	.30	.25	.26	.40	.18	...	...	...
27	158	.191	42.5	...	...	49.5	46.5	...	...	.06	.04	.11	.07	.12	.35	...	...	...
28	156	.124	35.0	...	...	47.5	46.0	...	...	.26	.03	.03	.08	.01	.15	...	...	...
29	175	.222	39.2	...	...	43.0	45.0	...	.07	...	.01	.02	.02	.02	.04	...	...	...
30	240	.256	46.8	...	...	46.5	45.5	...	...	...	.01	.02	.02	0	.01	...	...	...

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of May, 1910.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	175	.219	48.0	....	....	46.0	45.0	....	.38	.14	.05	.02	0	.02	.03	....	....	....
2	179	.395	58.0	....	....	52.0	45.0	....	.10	.06	.10	0	.01	.14	.03	....	....	6.4
3	142	.322	46.2	....	....	51.0	46.0	....	.74	....	.40	.80	.34	.48	.33	....	....	....
4	99	.182	41.2	....	....	48.0	47.0	....	.02	.15	.45	2.45	.28	.71	1.15	....	....	....
5	121	.156	40.5	....	....	45.5	47.0	....	....	.08	.12	.34	.07	.57	.34	....	....	....
6	148	.156	43.5	....	....	44.5	45.0	....	....	.20	.11	.33	.05	.06	.12	....	....	....
7	135	.219	55.0	....	....	47.5	46.0	....	....	.25	.02	.01	.03	.02	.07	....	....	....
8	75	.363	57.5	....	....	49.5	46.0	....	.06	....	0	.02	.01	0	.01	....	....	....
9	95	.342	51.0	....	....	51.0	47.0	....	.24	.04	.03	.03	.02	0	.01	....	....	5.9
10	105	.198	47.8	....	....	49.5	46.5	....	.10	.36	.03	0	0	0	.03	....	....	....
11	71	.173	40.2	....	....	49.0	46.0	....	.01	.29	.01	0	0	0	.02	....	....	....
12	138	.211	41.0	....	....	45.5	47.0	....	....	.22	0	0	0	0	.02	....	....	....
13	89	.181	40.2	....	....	45.5	47.5	....	....	.20	0	0	0	0	0	....	....	....
14	72	.198	41.0	....	....	46.0	47.0	....	....	.18	0	0	0	0	0	....	....	....
15	12	211	45.8	....	....	45.5	48.5	....	....	.18	.01	0	0	0	.01	....	....	....
16	99	.241	55.2	....	....	45.5	51.5	....	....	.20	0	0	0	0	0	....	....	6.8
17	76	.254	55.5	....	....	50.5	47.5	....	.20	....	0	0	0	0	0	....	....	....
18	195	.267	48.5	....	....	50.0	48.5	....	.44	.08	.01	.02	0	0	.02	....	....	....
19	159	.228	52.5	....	....	50.5	48.0	....	....	.10	0	0	0	0	0	....	....	....
20	121	.411	62.0	....	....	52.0	48.0	....	.56	.11	0	0	0	0	0	....	....	....
21	52	.502	59.8	....	....	50.5	48.0	....	.02	.13	0	0	0	0	0	....	....	....
22	128	.510	63.5	....	....	59.0	49.5	....	.01	.09	.01	.01	0	.17	.23	....	....	....
23	123	.476	63.0	....	....	58.0	49.5	....	....	.20	0	0	0	0	0	....	....	7.1
24	84	462	60.2	....	....	59.5	48.0	....	.90	0	.06	0	0	.12	.07	....	....	....
25	90	371	53.8	....	....	59.5	50.5	....	.48	....	.46	.59	.62	.76	.85	....	....	....
26	53	.265	49.2	....	....	56.5	50.5	....	....	.10	.50	1.13	.87	1.35	1.36	....	....	....
27	151	.331	48.5	....	....	54.0	51.0	....	.13	.33	.28	.16	.07	.45	.61	....	....	....
28	91	.289	57.0	....	....	55.0	51.5	....	....	.25	.03	.05	.04	.02	.07	....	....	....
29	75	.421	62.0	....	....	56.5	51.5	....	.19	.39	.04	.05	.07	.06	.14	....	....	....
30	59	.364	49.0	....	....	56.0	52.0	....	.58	1.03	.17	.11	.10	.11	.08	....	....	6.1
31	52	.283	49.2	....	....	52.0	52.0	....	.04	....	.09	.24	.12	.11	.06	....	....	....

Graefenburg Hydrophysical Records — (*Continued*).

Month of June, 1910.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	Mean Soil Temperature.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	Percolation Through Lysimeter. *Inches.*					Accumulated Snow on Ground in Woods. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	76	.281	45.8	......	......	51.0	51.5	......	.09	.04	.07	.07	.07	.04	19	......	......	......
2	82	.316	51.2	......	......	50.5	51.0	......	......	.03	.03	.06	.05	.03	.20	......	......	......
3	78	.253	47.2	......	......	53.5	51.0	......	......	.09	0	.05	.03	.01	.05	......	......	......
4	105	.214	46.2	......	......	52.0	50.5	......	......	.15	.02	0	.01	.02	.02	......	......	......
5	84	.321	49.5	......	......	50.0	51.0	......	1.05	......	47	2.63	.87	.36	3.23	......	......	......
6	64	.328	58.8	......	......	55.5	51.0	......	.55	.01	1.35	2.06	1.20	1.22	2.20	......	......	5.9
7	80	.313	49.2	......	......	53.5	51.0	......	.06	......	.61	3.00	.47	.65	2.50	......	......	......
8	59	.279	56.8	......	......	57.0	51.5	......	......	.10	.10	2.80	.08	.09	2.90	......	......	......
9	81	.304	58.2	......	......	58.0	52.0	......	......	.15	.05	2.60	.06	.06	.19	......	......	......
10	59	.311	54.5	......	......	58.0	52.5	......	.22	......	.01	1.30	.03	.02	08	......	......	......
11	57	.412	55.2	......	......	58.0	53.0	......	.50	......	.10	3.80	.02	.11	3.43	......	......	......
12	49	.434	57.8	......	......	54.0	53.0	......	.13	......	.04	3.50	.05	.06	.82	......	......	......
13	52	.334	63.8	......	......	59.0	53.5	......	......	.08	.07	2.40	.04	.12	.08	......	......	5.2
14	49	.413	69.2	......	......	63.0	54.0	......	......	.10	.12	.17	.02	.09	.05	......	......	......
15	51	.462	67.2	......	......	66.5	54.5	......	......	.15	.10	.01	0	.03	.01	......	......	......
16	33	.540	62.2	......	......	61.5	55.0	......	.11	.01	.01	0	0	0	0	......	......	......
17	41	.495	68.0	......	......	66.5	55.5	......	.70	.04	0	.02	0	.02	.02	......	......	......
18	66	.547	68.2	......	......	66.5	56.0	......	.12	......	.09	.01	.01	.05	.10	......	......	......
19	50	.533	70.0	......	......	67.0	57.0	......	......	.04	.05	.03	0	.05	22	......	......	......
20	60	.475	73.8	......	......	68.5	57.5	......	......	.16	0	.04	0	.01	.04	......	......	5.1
21	44	.502	72.5	......	......	68.5	58.0	......	......	.20	.06	0	.01	.01	.04	......	......	......
22	68	542	73.0	......	......	69.0	58.5	......	......	.30	0	.01	0	0	0	......	......	......
23	65	.483	70.2	......	......	69.5	60.0	......	......	.33	0	.01	.01	0	0	......	......	......
24	60	.416	65.0	......	......	66.0	56.5	......	......	.32	.01	0	0	0	.01	......	......	......
25	12	.433	64.2	......	......	62.5	60.0	......	......	.30	0	0	0	0	0	......	......	......
26	62	.497	63.8	......	......	73.5	60.0	......	......	.29	0	0	0	0	0	......	......	......
27	117	.555	66.5	......	......	67.0	60.0	......	.35	......	0	0	0	0	0	......	......	5.1
28	64	.490	65.0	......	......	67.0	60.5	......	......	.15	0	0	0	0	0	......	......	......
29	56	.480	70.8	......	......	68.5	61.0	......	......	.20	0	0	0	0	0	......	......	......
30	45	.480	66.0	......	......	66.0	61.0	......	......	.22	0	0	0	0	0	......	......	......

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of July, 1910.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	57	.590	69.2			66.5	61.0			.06	0	0	0	0	0			
2	51	.654	70.8			68.5	61.0			.12	0	0	0	0	0			
3	59	.620	72.5			70.5	61.5			.10	0	0	0	0	0			
4	79	.469	69.0			76.0	62.0			.11	0	0	0	0	0			8.1
5	58	.456	74.3			70.0	62.0			.12	0	0	0	0	0			
6	59	.347	65.5			70.5	62.0			.08	0	0	0	0	0			
7	82	.583	67.8			66.0	62.0		.25	.09	0	0	0	0	0			
8	81	.561	72.2			71.5	62.0			.07	0	0	0	0	0			
9	109	.633	76.8			70.5	62.0			.12	0	0	0	0	0			
10	92	.709	74.8			73.5	63.0			.13	0	0	0	0	0			
11	109	.435	71.2			72.0	63.0			.10	.01	0	0	0	0			9.9
12	108	.466	71.5			66.5	63.5		.13	.05	0	0	0	0	.01			
13	57	.469	69.2			71.0	64.0			.15	0	0	0	0	0			
14	71	.420	64.5			68.5	64.0			.12	0	0	0	0	0			
15	86	.461	69.5			69.5	64.0			.16	0	0	0	0	0			
16	42	.538	62.8			66.0	64.0		.55	.30	0	0	0	0	0			
17	63	.420	67.2			68.5	63.5			.08	0	0	0	0	0			
18	52	.403	61.5			66.0	63.0			.08	0	0	0	0	0			11.2
19	60	.512	60.0			64.0	63.0		.03	.07	0	0	0	0	0			
20	80	.527	63.0			66.5	63.0			.12	0	0	0	0	0			
21	135	.522	63.0			66.0	63.0		.11	.03	0	0	0	0	0			
22	76	.625	67.8			66.0	63.0		.13	.27	0	0	0	0	0			
23	70	.642	72.0			66.0	63.0			.10	0	0	0	0	0			
24	118	.624	80.8			72.5	63.0		.51	.21	0	0	0	0	0			
25	131	.580	69.0			69.0	63.0		.24	.94	0	0	0	0	0			12.7
26	110	.530	64.8			66.5	63.5		.02		0	0	.01	0	0			
27	61	.543	61.8			65.5	64.0		.65	.57	0	0	.20	0	0			
28	96	.425	62.8			67.5	64.0			.04	0	0	.18	0	0			
29	114	.403	66.5			61.5	64.0		.11	.05	0	0	0	0	0			
30	167	.443	64.0			66.5	64.0			.02	0	0	0	0	0			
31	138	.377	61.2			65.0	64.0			.10	0	.15	0	0	0			

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of August, 1910.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	86	.456	62.0			64.0	64.0		.38	.18	0	0	0	0	0			13.9
2	85	.465	61.8			66.0	64.0			.08	0	0	0	0	0			
3	173	.746	75.2			67.5	64.0		.09	.05	0	0	0	0	0			
4	130	.680	72.8			69.5	64.0		.30	.14	0	0	0	0	0			
5	170	.382	57.8			66.0	64.0		.08		0	0	0	0	0			
6	133	.467	59.0			61.0	64.0		.04	0	0	0	.04	0	0			
7	75	.456	61.5			63.0	64.0			.06	0	0	0	0	0			
8	70	.462	64.5			61.5	64.0			.08	0	0	0	0	0			14.6
9	136	.555	68.8			64.5	64.0		.11	.03	0	0	0	0	0			
10	121	.523	60.8			63.0	64.0		.50	.10	0	0	0	0	0			
11	101	.509	61.2			64.0	64.0			.08	0	0	0	0	0			
12	81	.568	64.5			60.5	64.0			.15	0	0	0	0	0			
13	110	.573	72.8			64.0	63.5			.20	0	0	0	0	0			
14	64	.564	66.5			63.5	63.0			.09	0	0	0	0	0			
15	57	.615	67.8			69.0	63.0			.08	0	0	0	0	0			15.1
16	152	.541	63.8			68.0	63.5			.12	0	0	0	0	0			
17	129	.420	61.0			66.5	64.0			.08	0	0	0	0	0			
18	135	.513	62.2			64.0	64.0		.32	.16	0	0	0	0	0			
19	89	.417	55.8			64.5	64.0			.06	0	0	0	0	0			
20	85	.368	57.0			63.0	64.0			.08	0	0	0	0	0			
21	118	.440	68.5			65.0	64.0			.08	0	0	0	0	0			
22	172	.528	66.0			64.5	64.0		.02	.08	0	0	0	0	0			15.4
23	182	.607	69.0			65.5	64.0			.15	0	0	0	0	0			
24	179	.624	72.5			66.0	64.0			.14	0	0	0	0	0			
25	251	.579	69.2			67.0	64.0		.31	.11	.07	0	.06	0	.04			
26	154	.342	55.2			64.0	64.0			.06	0	0	0	0	0			
27	63	.338	55.2			57.5	64.0			.07	0	0	0	0	0			
28	61	.373	63.2			63.0	64.0			.10	0	0	0	0	0			
29	100	.359	59.8			63.0	64.0			.11	0	0	0	0	0			15.8
30	198	.386	68.2			63.5	64.0			.10	0	0	0	0	0			
31	143	.495	65.0			62.5	64.0		.70	.25	0	0	0	0	.02			

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of September, 1910.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	43	.463	61.8			61.5	64.0			.06	0	0	0	0	0			
2	96	.379	62.0			66.0	63.0			.08	0	0	0	0	0			
3	156	.529	62.8			61.5	63.0		.30	.15	0	0	0	0	0			
4	12	.538	64.8			66.0	63.0		.02		.01	0	0	0	0			
5	133	.686	68.8			65.5	63.0		1.51	.21	0	0	0	0	0			16.1
6	141	.679	69.5			70.0	63.0		.27		0	.01	0	0	.07			
7	129	.457	58.5			65.5	63.0			.04	0	0	0	0	.05			
8	101	.474	61.0			63.5	63.0		.37		.02	0	0	0	.10			
9	160	.391	54.0			62.5	63.0			.08	.02	0	0	0	.10			
10	89	.285	57.0			61.5	63.0			.09	0	0	0	0	.08			
11	94	.405	61.5			60.5	63.0			.11	0	0	0	0	.01			
12	167	.572	66.2			64.5	63.0			.10	0	0	0	0	.02			16.2
13	85	.449	55.0			60.5	63.0		.13		0	0	0	0	.04			
14	94	.288	51.8			60.0	63.0			.10	.01	0	0	0	0			
15	86	.331	52.8			58.5	63.0			.12	.01	0	0	0	0			
16	26	.335	55.5			59.0	61.0			.11	0	0	0	0	0			
17	109	.245	61.8			59.0	61.0			.10	0	0	0	0	0			
18	68	.268	58.0			59.0	61.0		.03		0	0	0	0	0			
19	168	.244	52.5			57.5	61.0			.12	0	0	0	0	0			16.2
20	86	.433	57.5			60.0	61.0			.13	0	0	0	0	0			
21	109	.362	53.2			60.5	61.0			.15	0	0	0	0	0			
22	136	.287	51.0			52.0	61.0			.12	0	0	0	0	0			
23	116	404	58.2			55.5	61.0		.11	.03	0	0	0	0	0			
24	246	.463	56.2			53.0	61.0		.35	.15	.03	0	.07	0	0			
25	98	.501	60.0			56.5	61.0		1.48	.28	.18	.02	.05	.04	.05			
26	93	.458	58.8			60.0	61.0			.06	.44	0	0	0	14			16.2
27	127	.470	61.5			62.5	61.0		.60	.15	.12	0	.18	0	.04			
28	125	.345	54.0			58.5	60.0			.06	.16	0	.12	0	.04			
29	92	.334	56.5			57.0	60.0			.08	.03	0	.12	.01	.09			
30	258	.403	59.8			56.5	60.0			.10	.02	.01	.02	0	.03			

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of October, 1910.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	333	.310	55.8			58.5	60.0		.05		.03	0	.03	0	.04			
2	107	.206	44.0			52.0	60.0			11	0	0	0	0	.01			
3	181	.316	54.0			53.5	60.0			.12	.01	0	0	0	0			15.9
4	304	.450	64.0			55.5	60.0			.14	.01	0	0	0	.02			
5	170	588	68.5			61.5	59.0			.08	.01	.01	0	0	.01			
6	181	.510	61.2			65.0	59.0		40	.05	0	0	0	0	0			
7	22	.253	40.8			54.0	59.0			.06	.01	0	.01	0	0			
8	144	.227	43.5			51.0	59.0			.10	0	.01	0	0	.01			
9	177	.282	48.8			51.5	58.0			.08	.01	0	.01	0	0			
10	145	.270	45.2			49.5	58.0			.13	0	0	0	0	0			16.2
11	179	.302	50.2			51.0	57.0			.09	0	0	0	0	0			
12	144	147	37.0			51.0	56.0			11	0	0	0	0	0			
13	173	.210	41.8			46.0	56.0			.12	0	0	0	0	0			
14	99	.353	53.0			52.5	55.0			14	0	0	0	0	0			
15	201	.367	52.5			50.5	55.0			.10	0	0	0	0	0			
16	150	.302	52.0			53.5	55.0			.16	0	0	0	0	0			
17	93	248	46.0			50.5	55.0			.14	0	0	0	0	0			15.4
18	180	.215	58.0			51.5	55.0			.11	0	0	0	0	0			
19	175	386	61.0			54.5	55.0			.10	0	0	0	0	0			
20	85	.398	53.5			53.0	55.0			.13	0	0	0	0	0			
21	247	.267	49.0			53.0	55.0		.09	.01	0	0	0	0	0			
22	148	.235	39.0			48.5	55.0				0	0	0	0	0			
23	160	.218	40.5			45.5	54.5		.20	.02	0	0	0	0	.01			
24	135	248	45.0			46.5	54.0		.12	0	0	0	0	0	02			14.6
25	205	.250	41.5			47.5	53.5		.09		0	0	0	0	.03			
26	155	.176	35.2			42.0	53.0		.25	.12	0	0	0	0	.03			
27	233	.211	41.2			42.0	53.0		.32	.04	0	0	0	0	.05			
28	152	.183	35.2			41.5	52.0			.06	0	0	0	0	.05			
29	101	.154	31.0			40.0	52.0		.05		0	0	0	0	.02			
30	50	.127	34.8			42.0	51.0			.06	0	0	0	0	.03			
31	189	.159	36.8			40.0	50.0			.06	0	0	0	0	0			16.2

GRAEFENBURG HYDROPHYSICAL RECORDS — (*Continued*).

Month of November, 1910.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	MEAN SOIL TEMPERATURE.		Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	PERCOLATION THROUGH LYSIMETER. *Inches.*					ACCUMULATED SNOW ON GROUND IN WOODS. *Inches.*		Depth to water in well. *Feet.*
						2 inches depth.	24 inches depth.				1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Snow.	Water.	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	213	.135	45.8			38.5	49.0			.05	.03	.09	0	0	.11			
2	133	.215	39.2			44.0	49.0		.19	.02	.12	.05	0	0	.06			
3	137	.181	32.0			39.5	49.0		.27	.07	.04	.06	0	0	.05			
4	209	.182	32.0			38.5	49.0		.45		.05	.06	0	0	.05			
5	184	.194	34.0			37.5	48.5		.15		.05	.07	.01	0	.08			
6	153	.177	32.8			38.5	47.5		.03		.08	.06	.08	0	.06			
7	161	.151	29.5			36.5	46.5		.01		.07	.15	.17	.03	.24			13.7
8	175	142	30.5			35.5	46.0		.04		.13	.08	.15	.02	19			
9	152	.187	35.0			36.5	45.0		.78		.22	1.36	.12	.06	2.12			
10	224	176	40.8			38.5	44.0		.02		.39	3.58	.32	.36	3.70			
11	174	.125	30.2			37.5	44.0		.06		.07	3.08	.10	.13	.95			
12	178	.152	29.0			35.0	44.0				.05	.12	.06	.06	.02			
13	209	.159	29.2			34.5	44.0		.34		.04	.02	.02	.02	.01			
14	83	.149	29.8			35.0	44.0		.05		.03	.02	.04	.06	0			12.8
15	195	.138	28.2			35.5	43.0		.05		.07	.04	.02	.03	0			
16	267	134	29.0			35.0	43.0				.02	0	.02	.03	0			
17	178	.125	28.8			34.0	43.0				.03	.03	.03	.02	0			
18	186	124	28.0			31.0	43.0		.08		.01	.02	.01	.02	0			
19	115	.101	25.5			33.5	42.5		.01		.02	.01	.01	.01	0			
20	152	.081	19.8			33.5	42.0				0	0	0	0	0			
21	147	.130	30.2			32.5	42.0		.03		.05	.03	.02	.09	0			9.6
22	89	.172	32.2			32.5	42.0		.02		.06	.03	.03	.08	.01			
23	189	.170	34.5			34.5	41.0		.08		.06	28	.02	.02	0			
24	110	187	33.5			35.0	41.0				.30	1.86	21	.05	2.41			
25	134	.175	33.2			35.0	41.0		.15		.25	3.00	26	12	.42			
26	196	.137	29.5			34.5	41.0				.03	.06	.03	.03	.01			
27	142	.105	27.0			34.5	41.0				.04	03	.02	.06	0			
28	204	.134	29.5			33.0	41.0		.12		0	0	0	0	0			7.1
29	102	.162	20.8			32.5	41.0		.14		.10	.11	.11	.07	.01			
30	128	.144	27.5			33.0	40.0		•.15		0	0	0	0	0			

• Snow.

GRAEFENBURG HYSDROPHYSICAL RECORD—(*Concluded*).

Month of December, 1910.

DAY.	Total wind movement, 24 hours.	Mean vapor pressure.	Mean air temperature.	Mean water temperature.	Mean of maximum and minimum thermometers.	Mean Soil Temperature. 2 inches depth.	Mean Soil Temperature. 24 inches depth.	Mean barometer. *Inches.*	Precipitation. *Inches.*	Evaporation from water. *Inches.*	Percolation Through Lysimeter, *Inches.* 1 Clay, long grass.	2 Clay, short grass.	3 Clay and loam, bare.	4 Sand, long grass.	5 Sand, bare.	Accumulated Snow on Ground in Woods, *Inches.* Snow.	Water.	Depth to water in well. *Feet.*
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
1	110	.108	22.8	....	....	34.0	40.0	....	* .03	....	0	0	0	0	0	....	....	....
2	187	.075	19.8	....	....	32.5	40.0	....	* .06	....	0	0	0	0	0	....	....	....
3	116	.044	21.0	....	....	32.0	39.5	....	* .02	....	.01	.02	.02	.02	0	....	....	....
4	68	.054	17.2	....	....	32.5	39.0	....	....	....	.03	.02	.01	.01	.01	....	....	....
5	80	.042	8.2	....	....	32.0	39.0	....	....	....	0	0	0	0	0	....	....	6.3
6	80	.046	9.2	....	....	30.5	39.0	....	....	....	0	0	0	0	0	....	....	....
7	172	.055	11.0	....	....	30.0	39.0	....	....	....	0	0	0	0	0	....	....	....
8	195	.064	15.8	....	....	30.0	39.0	....	* .04	....	.01	.02	.03	.04	0	....	....	....
9	94	.047	8.2	....	....	30.0	39.0	....	....	....	.05	.02	.02	.03	0	....	....	....
10	196	.043	7.5	....	....	30.0	39.0	....	* .02	....	.02	.02	.02	0	0	....	....	....
11	105	.045	7.5	....	....	30.0	38.5	....	....	....	.05	.03	0	0	0	....	....	....
12	162	.052	6.8	....	....	30.0	38.0	....	* .01	....	.05	.01	.02	.01	0	....	....	6.2
13	192	.076	12.8	....	....	30.0	38.0	....	....	....	.04	.02	.04	.01	0	....	....	....
14	273	.115	30.0	....	....	30.0	38.0	....	....	....	0	.03	0	0	0	....	....	....
15	279	.095	26.2	....	....	30.0	38.0	....	* .06	....	0	.01	0	0	0	....	....	....
16	120	.065	13.8	....	....	30.0	38.0	....	....	....	0	0	0	0	0	....	....	....
17	69	.069	11.2	....	....	30.0	38.0	....	* .02	....	0	0	0	0	0	....	....	....
18	274	.086	19.8	....	....	30.0	38.0	....	* .05	....	.02	0	.02	.03	0	....	....	....
19	171	.113	28.2	....	....	30.0	38.0	....	....	....	0	0	0	0	0	....	....	6.8
20	254	.084	20.0	....	....	30.0	37.0	....	* .03	....	.03	0	0	0	0	....	....	....
21	172	.038	3.8	....	....	30.0	37.0	....	....	....	0	0	0	0	0	....	....	....
22	125	.047	10.8	....	....	30.0	37.0	....	....	....	0	0	0	0	0	....	....	....
23	141	.109	27.2	....	....	28.0	37.0	....	.39	....	.03	.12	0	.02	0	....	....	....
24	272	.120	24.8	....	....	28.0	37.0	....	* .02	....	.04	.08	.02	0	.01	....	....	....
25	327	.065	11.0	....	....	28.0	37.0	....	....	....	.06	.25	.03	.01	.01	....	....	....
26	146	.062	9.5	....	....	28.0	37.0	....	* .06	....	.04	.11	.01	0	.01	....	....	7.5
27	178	.112	27.8	....	....	28.0	37.0	....	....	....	.02	.24	0	.02	0	....	....	....
28	229	.144	29.2	....	....	30.5	36.0	....	* .19	....	.01	.02	.01	0	.40	....	....	....
29	120	.120	23.0	....	....	31.0	36.0	....	.30	....	.03	2.98	0	0	2.18	....	....	....
30	278	.035	5.8	....	....	31.5	36.0	....	....	....	0	1.50	0	.02	1.50	....	....	....
31	189	.075	13.2	....	....	30.0	36.0	....	....	....	0	1.52	0	0	1.56	....	....	....

* Snow.

NINE-MILE CREEK.

NINE-MILE CREEK AT POWELL'S BRIDGE, NEAR STITTVILLE, N. Y.

A gaging station was established at Powell's bridge, one mile below the village of Stittville, November 4, 1905, by C. A. Poole. Observations of the stage of the stream are taken each morning and afternoon by Mrs. Raymer Powell, from a weight-and-chain gage attached to the bottom chord on the down-stream side of the bridge.

Nine-Mile creek drains a large portion of the territory on the north side of the Mohawk river between Utica and Rome, emptying into the latter stream near Oriskany. Its channel will be improved and used as a feeder for the diversion of water from West Canada creek to the summit level of the improved Erie canal, according to present plans. The drainage area above the station is 62.6 square miles.

A gaging station was maintained at this point by the U. S. Deep Waterways Commission during their survey in 1898. At that time there was a dam about 200 feet below the bridge, which has since been destroyed, leaving the flow unimpeded. The channel is of rock, of uniform cross-section and straight for several hundred feet each way from the bridge, and the conditions are favorable for current-meter discharge measurements, except in times of very low water. Measurements are made from the up-stream side of the bridge.

Owing to the sluggish velocity at low stages the record for very low water conditions is considered to be roughly approximate only.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Nine-Mile Creek at Powell's Bridge, near Stittville, N. Y. [a]

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	[b]	484.32	485.47	484.17	484.42	485.02	483.82	483.32	483.32	483.87	484.57	485.17
2.....	484.22	484.32	485.42	484.12	484.42	485.52	483.82	483.32	483.47	483.87	484.62	484.17
3.....	484.22	484.32	485.52	484.12	484.42	485.42	483.82	483.52	483.82	483.87	484.77	484.12
4.....	484.22	484.42	485.57	484.02	484.52	485.52	483.72	483.57	483.92	483.87	484.92	484.12
5.....	484.22	484.42	485.62	483.97	484.52	485.52	483.72	483.87	484.27	483.97	485.42	484.22
6.....	484.22	484.37	485.97	484.22	484.42	485.62	483.72	483.92	484.52	484.47	485.42	484.22
7.....	484.22	484.32	486.27	484.22	484.42	485.62	483.77	483.92	484.82	484.52	484.47	484.27
8.....	484.22	484.32	486.22	484.12	484.52	485.57	483.87	483.92	484.67	484.47	484.92	484.22
9.....	484.22	484.32	485.32	484.12	484.52	485.57	483.87	483.97	484.62	484.57	485.22	484.22
10.....	484.22	484.32	484.52	484.12	484.52	484.62	483.92	484.07	484.17	484.37	485.97	484.22
11.....	484.32	484.32	484.42	484.12	484.27	484.62	483.82	484.87	484.22	484.17	485.17	484.27
12.....	484.32	484.32	484.42	484.02	484.22	485.22	483.82	484.52	484.02	484.02	485.12	484.22
13.....	484.32	484.32	484.52	484.02	484.12	484.22	483.92	484.32	483.92	484.02	485.02	484.22
14.....	484.32	484.32	484.97	484.02	484.12	484.62	483.87	484.17	483.92	483.92	484.52	484.22
15.....	484.42	484.22	484.42	483.92	484.02	484.52	483.82	484.02	483.82	483.92	484.32	484.22
16.....	484.42	484.22	485.02	483.92	484.07	484.97	483.72	483.87	483.92	483.92	484.22	484.22
17.....	484.42	484.22	485.12	483.92	484.17	484.92	483.57	483.87	483.97	483.82	484.22	484.22
18.....	484.52	484.22	485.22	483.92	484.42	484.27	483.47	484.12	484.07	483.82	484.32	484.22
19.....	484.82	484.22	485.32	484.02	484.42	484.22	483.37	484.22	484.02	483.82	484.22	484.22
20.....	485.97	484.32	486.47	484.02	484.52	484.07	483.32	484.12	483.92	484.02	484.22	484.22
21.....	485.97	484.32	485.97	484.12	484.52	483.97	483.22	483.97	483.97	484.02	484.32	484.22
22.....	485.32	484.32	485.02	484.17	484.52	483.92	483.27	483.92	483.07	484.02	484.27	484.22
23.....	485.32	484.32	484.92	484.27	484.87	483.87	483.27	483.92	483.17	484.02	484.12	484.32
24.....	485.27	484.32	484.92	484.32	484.47	483.82	483.32	483.87	483.22	484.12	484.22	484.32
25.....	485.22	484.32	484.92	484.32	485.12	483.87	483.32	483.82	484.02	484.12	484.37	484.32
26.....	485.12	485.22	485.07	484.37	485.32	483.82	483.27	483.97	484.87	484.27	484.47	484.32
27.....	484.42	485.32	485.07	484.12	484.37	483.82	483.32	484.02	484.02	484.87	485.07	484.32
28.....	484.32	485.42	485.02	484.12	484.27	483.82	483.47	483.92	485.07	485.02	485.27	484.47
29.....	484.32	......	484.92	484.12	484.07	483.82	483.87	483.22	484.17	484.52	485.32	485.32
30.....	484.22	......	484.37	484.12	484.77	483.82	483.92	483.27	484.02	484.57	485.47	485.57
31.....	484.22	......	484.22	......	484.52	......	483.92	483.32	......	484.02	......	486.12

[a] The datum of the gage at this station is approximately determined. [b] No record.

Current-meter Discharge Measurements of Nine-Mile Creek at Powell's Bridge, near Stittville, N. Y

DATE.	Hydrographer.	GAGE READING.			Meter No.	Lateral interval.	Submergence depth.	Total area.	Total width.	Computed discharge.
		Beginning.	Ending.	Mean.						
1910.						*Feet.*		*Square feet.*	*Feet.*	*Second-feet.*
June 17	H. V. Button	2.25	2.25	2.25	559	5	6 10	58.60	73	49.68
August 11	Barrett & Patchke.....	2.48	2.48	2.48	462	5	6 10	82.24	74	98.25
August 17	Clark & Button........	2.00	2.10	2.05	462	5	6 10	49.33	72.2	19.08
August 30	A. R. Patchke........	2.05	2.05	2.05	559	5	6 10	40.91	66.5	12.79

Mean Daily Discharge, Second-feet, of Nine-Mile Creek at Powell's Bridge, near Stittville, N. Y

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1.....	2,952	170	144	65	590	7	8	7	*7	2,524	132	*19
2.....	408	170	144	56	556	*7	29	28	7	360	108	37
3.....	638	*170	*245	56	1,976	8	147	28	7	556	*524	56
4.....	*a*	170	384	9	2,952	8	12	*7	184	*a*	524	56
5.....	318	170	338	56	*972	8	7	7	132	2,730	97	65
6.....	*108	170	338	19	360	24	7	7	7	*1,845	144	56
7.....	132	170	338	*11	384	314	*7	7	7	3,449	2,423	56
8.....	408	170	299	14	360	232	7	7	*7	*a*	170	*46
9.....	360	170	299	15	408	*58	8	7	7	*a*	75	46
10.....	97	*170	*262	19	338	29	7	7	7	3,352	*37	1,845
11.....	97	170	262	46	408	29	12	*7	11	3,552	37	360
12.....	108	170	262	56	*408	8	7	7	14	3,352	46	318
13.....	*86	170	318	56	360	8	7	7	7	*360	37	46
14.....	75	170	384	*65	318	7	*7	7	7	46	14	37
15.....	86	170	384	19	262	7	7	7	*7	46	19	*28
16.....	75	170	708	19	229	*7	7	7	7	37	19	37
17.....	108	*170	*1,406	37	97	7	8	7	7	37	*19	37
18.....	132	170	1,714	37	11	7	12	*7	7	7	19	37
19.....	262	170	318	19	*8	7	7	7	7	7	37	19
20.....	*2,184	170	638	11	11	7	7	7	170	*7	28	19
21.....	120	170	384	*7	8	7	*14	7	408	7	19	19
22.....	120	170	1,406	65	8	7	7	7	*120	7	14	*19
23.....	97	170	1,976	280	7	*7	7	7	132	7	11	556
24.....	132	*170	*1,406	1,795	8	7	7	7	785	7	*19	65
25.....	170	170	384	462	8	7	11	*7	1,201	7	19	86
26.....	157	170	245	2,423	*58	7	108	7	262	7	19	299
27.....	*170	170	213	590	29	7	97	7	120	*7	37	299
28.....	170	170	556	*338	20	7	*7	7	299	229	86	65
29.....	170	......	245	318	14	8	7	7	*408	360	299	*46
30.....	170	......	229	360	8	*29	7	7	3,552	170	56	37
31.....	170	......	*46	......	8	......	7	7	......	157	......	37
Mean...	343	170	522	244	361	29	17	8	263	830	170	153

a Gage height exceeded limits of rating curve. * Sunday.

Mean Daily Discharge, Second-feet, of Nine-Mile Creek at Powell's Bridge, near Stittville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
1.....	46	37	*37	120	318	213	7	10	10	7	*7	19
2.....	37	*37	108	2,321	245	37	7	*10	10	7	7	28
3.....	8	37	120	65	*280	14	7	7	10	7	7	37
4.....	7	37	132	75	184	19	7	7	7	*7	7	56
5.....	*7	37	65	*97	97	11	*7	12	7	7	7	56
6.....	19	37	86	280	65	7	7	24	*7	7	7	*56
7.....	28	37	65	132	198	*7	7	24	7	7	19	170
8.....	56	37	*19	120	262	7	7	12	7	7	*19	184
9.....	56	*37	37	360	360	7	7	*10	7	7	28	170
10.....	46	37	56	108	*245	132	7	7	7	14	37	170
11.....	46	37	65	97	75	37	7	7	7	*14	56	144
12.....	*213	37	97	*56	19	7	*7	10	7	7	28	144
13.....	170	37	245	65	7	7	7	10	*7	7	19	*157
14.....	120	37	524	65	157	*7	7	10	7	7	19	184
15.....	65	*a*	*492	86	108	7	7	10	7	7	*19	184
16.....	28	**a*	434	75	120	28	7	*10	7	7	46	170
17.....	19	*a*	86	65	*299	19	7	10	7	7	56	170
18.....	19	229	56	37	144	7	360	115	7	*7	65	144
19.....	*19	197	56	*75	97	7	*170	62	7	7	75	170
20.....	19	86	86	75	65	14	46	21	*7	7	157	*170
21.....	19	37	86	46	37	*7	46	10	7	7	144	157
22.....	19	28	*132	56	14	7	56	10	7	7	*144	144
23.....	19	*28	318	37	14	7	37	*10	7	7	170	144
24.....	86	37	1,598	19	*11	7	115	10	7	7	170	144
25.....	37	37	434	28	7	7	115	10	7	*7	144	144
26.....	*19	56	492	*14	56	7	*52	10	7	7	132	144
27.....	75	86	972	7	132	7	24	7	*7	7	120	*170
28.....	37	75	1,406	56	86	*7	12	10	7	7	97	170
29.....	19	46	*229	75	245	7	12	10	7	7	*75	170
30.....	37	......	108	120	132	7	7	*10	7	7	56	198
31.....	37	......	75	......	*299	......	8	10	......	7	......	198
Mean.	46	56	278	161	141	22	38	16	7	8	62	141

a Gage height is above limits of rating curve. * Sunday.

Mean Daily Discharge, Second-feet, of Nine-Mile Creek at Powell's Bridge, near Stittville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1.....	213	318	120	347	2,730	71	7	*7	7	7	97	120
2.....	280	108	86	1,652	*2,624	52	7	7	7	7	132	144
3.....	*338	108	65	1,865	384	52	7	7	31	*19	120	157
4.....	872	132	65	*1,136	86	82	*7	7	60	37	97	120
5....	2,938	198	46	418	86	352	7	7	*50	19	97	*120
6.....	3,352	3,245	65	1,652	75	*329	7	7	50	28	97	97
7.....	1,304	*2,016	*46	1,815	86	192	7	7	7	37	*120	75
8.....	280	638	56	1,652	97	71	7	*7	7	56	144	56
9.....	184	556	86	394	*524	71	7	7	7	56	120	46
10....	*184	462	108	252	408	82	7	7	7	*56	120	28
11.....	97	184	86	*189	384	115	*7	7	7	56	86	19
12.....	86	144	108	189	408	139	7	7	*7	56	75	*19
13.....	120	132	108	219	434	*165	33	7	7	75	75	75
14.....	338	*120	*97	325	384	152	62	7	7	97	*65	97
15.....	318	132	86	287	338	82	71	*33	7	97	56	97
16.....	318	157	65	189	*1,201	71	71	42	7	120	46	97
17.....	*318	198	65	189	434	71	71	71	7	*120	65	97
18.....	318	213	75	*176	462	62	*82	101	7	120	75	97
19.....	360	431	86	149	75	71	82	125	*7	108	97	*97
20.....	360	*a*	86	125	56	*71	71	149	7	97	97	97
21.....	408	*872	*86	125	86	62	42	149	7	97	*97	97
22.....	462	434	65	113	75	52	7	*101	7	75	120	97
23.....	524	708	65	149	*75	33	7	79	7	75	132	75
24.....	**a*	*a*	86	137	75	33	7	79	7	*75	144	75
25.....	638	*a*.	97	*137	75	7	*52	79	7	65	157	75
26.....	338	1,714	556	113	7	7	7	79	*7	56	170	*75
27.....	318	120	638	99	75	*7	7	7	7	65	184	75
28.....	318	*75	*556	162	360	7	7	7	7	56	*157	75
29.....	318	......	462	204	75	7	7	*7	7	56	170	75
30.....	318	......	408	570	*56	7	7	7	7	37	144	97
31.....	*318	......	360	......	37	......	7	7	......	*37	.....	97
Mean...	551	537	161	501	396	86	25	39	12	63	112	86

a Gage height is above limits of rating curve. * Sunday.

Mean Daily Discharge, Second-feet, of Nine-Mile Creek at Powell's Bridge, near Stittville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	*a*	120	590	86	144	360	19	7	7	28	184	408
2.....	97	120	556	75	144	638	19	7	7	28	198	86
3.....	97	120	638	75	144	556	19	7	19	28	245	75
4....	97	144	708	56	170	638	11	7	37	28	299	75
5.....	97	144	785	46	170	638	11	28	108	46	556	97
6.....	97	132	1,508	97	144	785	11	37	170	157	556	97
7.....	97	120	2,117	97	144	785	14	37	262	262	157	108
8.....	97	120	2,016	75	170	708	28	37	213	157	299	97
9.....	97	120	492	75	170	638	28	46	198	184	434	97
10.....	97	120	170	75	170	198	37	65	86	132	1,508	97
11.....	120	120	144	75	108	198	19	280	97	86	408	108
12.....	120	120	144	56	97	134	19	170	56	56	384	97
13...	120	120	170	56	75	97	37	120	37	56	338	97
14.....	120	120	318	56	75	198	28	86	37	37	170	97
15.....	144	97	144	37	56	170	19	56	19	37	120	97
16...	144	97	338	37	65	318	11	28	37	37	97	97
17.....	144	97	384	37	86	299	7	28	46	19	97	97
18.....	170	97	434	37	144	108	7	75	65	19	120	97
19.....	262	97	492	56	144	97	7	97	56	19	97	97
20.....	1,508	120	2,524	56	170	65	7	75	37	56	97	97
21.....	1,508	120	1,508	75	170	46	7	46	46	56	120	97
22.....	492	120	338	86	170	37	7	37	7	56	108	97
23.....	492	120	299	108	280	28	7	37	7	56	75	120
24.....	462	120	299	120	157	19	7	28	7	75	97	120
25.....	434	120	299	120	384	28	7	19	56	75	132	120
26.....	384	434	360	132	492	19	7	46	280	108	157	120
27.....	144	492	360	144	132	19	7	56	56	280	360	120
28.....	120	556	338	144	108	19	7	37	360	338	462	157
29.....	120	......	299	144	65	19	28	7	86	170	492	492
30.....	97	......	132	144	245	19	37	7	56	184	590	708
31.....	97		97		170	.....	37	7		56	...	1,815
Mean...	269	158	613	83	160	272	17	52	85	94	298	199

a No record.

Monthly Discharge of Nine-Mile Creek at Powell's Bridge, near Stittville, N. Y.

[Drainage area, 59.97 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1907.					
January	2,952	75	343	5.81	6.70
February	170	170	170	2.88	3.00
March	1,976	46	522	8.84	10.19
April	2,423	7	244	4.13	4.61
May	2,952	7	361	6.11	7.04
June	314	7	29	0.491	0.548
July	147	7	17	0.288	0.332
August	28	7	8	0.135	0.156
September	3,552	7	263	4.45	4.96
October	3,552	7	830	14.10	16.26
November	2,423	11	170	2.88	3.21
December	1,845	19	153	2.59	2.99
1908.					
January	213	7	46	0.779	0.898
February	*a*	28	....	....	.. ..
March	1,508	19	278	4.71	0.543
April	2,321	7	161	2.73	3.05
May	360	7	141	2.39	2.76
June	213	7	22	0.372	0.415
July	360	7	38	0.643	0.741
August	115	7	16	0.271	0.312
September	10	7	7	0.119	0.133
October	14	7	8	0.135	0.156
November	170	7	62	1.05	1.17
December	198	19	141	2.39	2.76
1909.					
January	3,352	86	551	9.33	10.76
February	3,245	75	537	9.10	9.48
March	638	46	161	2.73	3.15
April	1,865	90	501	8.48	9.46
May	2,730	7	396	6.70	7.72
June	352	7	86	1.46	1.63
July	82	7	25	0.423	0.488
August	149	7	39	0.660	0.761
September	60	7	12	0.203	0.226
October	120	7	63	1.07	1.23
November	184	46	112	1.90	2.12
December	157	19	86	1.46	1.68
1910.					
January	1,508	97	269	4.56	5.25
February	556	97	158	2.68	2.79
March	2,524	97	613	10.50	12.11
April	144	37	83	1.42	1.58
May	492	56	160	2.72	3.14
June	785	19	272	4.62	5.16
July	37	7	17	0.29	0.33
August	280	7	52	0.89	1.03
September	360	7	85	1.45	1.67
October	338	19	94	1.61	1.86
November	1,508	75	298	5.06	5.63
December	1,815	75	199	3.38	3.90

Gage height exceeds limit of rating table.

PRECIPITATION RECORDS.

Rain gages have been established by this Department at several places on the Mohawk drainage area. Precipitation records have been kept as follows:

Daily Precipitation, in Inches, at Utica, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1						0.05			0.45			*0.37
2			0.17		0.05	0.30		0.24				
3		0.26							0.31		0.23	0.04
4	0.02	1.05		0.09	0.17				0.66			
5	0.64	0.02						0.40			0.69	
6	0.54			0.14	0.06	0.90		0.14	0.66		0.45	
7	0.30		0.15	0.41		0.48			0.13		0.18	
8	0.12		0.20			0.30						*0.12
9		0.10	0.15		0.14		0.18		0.15		0.30	
10	0.18	0.11			0.12			0.20		0.85	0.65	
11		0.50		0.04	0.06	0.15	1.00	0.87				
12		0.34		0.42		0.10						
13	0.02	0.10				0.35			0.02		0.30	
14	0.20	0.25	0.14						0.53		0.71	
15		0.05	0.03									
16												0.14
17		0.33				0.10	0.82					
18	0.08	0.25		0.03	0.08	0.85						
19	0.12			0.47	0.50			0.55	0.17		.50	
20		0.13	T	0.38								
21	0.51		0.09		0.81							
22							0.40			0.03		
23		0.37					0.24			0.50		
24		0.05							0.09			*0.56
25					0.77		0.41		0.80	0.40		*0.05
26	0.04			0.09			0.15	0.55	0.41	0.35		*0.06
27	0.40	0.21					0.18					0.30
28	0.35	1.00				0.22	0.10		1.12	0.30		
29	0.60			0.18							0.52	0.36
30	0.45				0.60						0.08	0.13
31			0.05		0.40		0.28					
Total	4.57	5.12	0.98	2.25	3.76	3.80	3.76	2.95	5.50	2.43	4.61	2.13

* Snow.   T means trace.

Daily Precipitation, in Inches, at Savage Reservoir, near Utica, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1	*0.04		*0.01		0.21				0.19	0.29		
2	*0.02		*0.05		1.03				0.05	0.18		
3		*0.06		0.10	*0.14		0.62			0.04	0.02	
4	0.06		*0.06	0.04	0.12						0.13	
5	0.02		*0.90			0.79			0.48			0.01
6	0.26	0.06	0.04		0.03	0.51			0.08		0.02	
7	0.02	0.05		0.22	0.23			0.05			0.05	
8			*0.10		0.05						0.29	0.18
9				*0.10							0.30	*0.03
10	*0.02	*0.22	0.32	*0.11	0.19			0.10				*0.02
11	0.13	0.60	*0.12	*0.02	0.58	0.55			0.76			*0.04
12	*0.14	*0.05	*0.03		0.02		0.06			0.60		
13	*0.51							0.02				*0.01
14	*0.05	*0.01	*0.05	1.10	0.12	0.38						0.87
15	0.21	0.65	*0.01	0.52	0.17					0.02		*0.01
16		1.62		0.03	0.49		0.13	2.43	0.21		0.04	*0.02
17	*0.52	0.45	*0.07	0.02	0.25		0.07	0.71	0.02	0.63	0.37	*0.05
18	*0.36	*0.04	*0.08	0.09	0.15	1.04		0.31		0.08	0.04	*0.10
19				0.03	0.03		0.23	0.35		0.37	*0.03	*0.02
20		0.98	*0.10	0.12			0.12	0.03			*0.01	
21		*0.05						0.32				
22			*0.01	0.10						0.42	0.16	*0.05
23							0.72			0.25	0.41	*0.13
24	0.30	0.56					1.51		0.52	0.24	0.02	
25	0.05	0.58	0.35				0.48			0.19	*0.91	
26		*0.04	0.78	0.05		0.09	0.05				*0.21	*0.20
27		*0.01	*0.04					0.08				*0.05
28	*0.03		0.13	0.15	0.62	0.29			0.34	0.18		*0.02
29					0.11	0.05				0.03	0.06	*0.05
30	*0.27		*0.02	0.42			0.43	0.29				*0.02
31	*0.10											
Total	3.11	6.03	3.27	3.22	4.54	3.70	3.42	4.69	2.65	3.52	3.07	1.88

* Snow.

Daily Precipitation, in Inches, at Savage Reservoir, near Utica, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1			0.22	0.07		0.05			0.95			0.16
2			0.05		0.41	0.11		0.45		0.04		0.04
3	*0.04	*0.16			0.10						0.27	0.04
4	*0.03	*0.43		0.01	0.76			0.21	0.35		0.45	0.03
5		*0.02		0.10				0.24	0.09		0.60	0.02
6	*1.05	*0.08			0.03	1.06		0.13	1.69	0.02	0.12	
7	*0.45		0.44	0.31		0.80		0 4	0.26	0.49	0.08	
8	*0.02		*0.02	0.13		0.14	0.45				0.03	0.04
9			*0.04	0.02	0.06				0.28	0.07	0.05	0.05
10	*0.06	*0.13		0.07	0.24	0.10		0.15	0.02		0.89	
11					0.11	0.35		0.76			0.03	0.02
12		*0.26		*0.35	0.01	0.51					0.01	0.01
13		*0.23				0.15	0.16				0.11	0.01
14	*0.02	*0.05	0.20						0.22		0.22	0.01
15	*0.08	*0.01	*0.02								0.06	
16		*0.02									0.07	0.08
17		*0.17				0.24	0.64				0.01	0.01
18	*0.05	*0.58		0.10	0.17	1.15						0.03
19	0.43			0.35	0.48	0.15		0.62	0.07		0.13	0.05
20				0.05			0.11				0.02	0.01
21		0.09	0.20		0.59							0.04
22	0.26	0.03		0.04	0.05		0.18			0.10	0.05	
23	*0.01	0.43	0.01		0.02		0.15	0.02		0.39	0.05	
24									0.16	0.25	0.10	0.53
25	*0.11				1.02		0.45		0.34	0.15	0.02	0.03
26				0.90	0.46		0.34	0.38	1.55	0.19	0.13	0.01
27	*0.16	0.13		0.03			0.06			0.28		0.08
28	*0.10	1.10			0.14	0.33	0.65		0.85	0.36		
29	*0.04									0.12	0.16	0.25
30	*0.78			0.05	0.17		0.14			*0.04	0.18	0.41
31	*0.05		0.02		0.78							
Total	3.74	3.92	1.22	2.58	5.60	5.14	3.33	3.00	6.83	2.50	3.82	1.96

* Snow.

Daily Precipitation, in Inches, at Graefenburg, near Utica, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1	*0.03				0.20				0.10	0.25		
2			*0.03		0.95				0.05	0.12		
3		*0.04	*0.05	0.09	0.05		0.56			0.03		
4	*0.05		*1.30		0.11						0.05	
5			*0.03			0.85			0.33			0.01
6	0.18	0.04	*0.09		0.02	0.42			0.10			
7		0.05		0.17	0.22			0.03			0.04	
8					0.05						0.02	0.20
9			0.28	*0.07							0.42	*0.02
10	*0.02	*0.10	0.10	*0.10	0.11			0.03				*0.02
11	0.11	*0.30	*0.02	*0.01	0.52	0.60			0.63			
12	0.10	*0.01			0.01		0.06			0.55		
13	*0.44		*0.05									0.91
14	*0.03			0.95	0.12	0.40						*0.01
15	0.15	*0.60		0.50	0.15					0.02		*0.02
16		*1.55	*0.05		0.40		0.13	2.03	0.12		0.04	*0.04
17	*0.30	*0.45	*0.07	0.01	0.27		0.07	0.72	0.02	0.45	0.39	*0.09
18	*0.35	*0.03		0.08	0.15	0.95		0.17		0.05	0.02	*0.01
19			*0.10	0.03	0.02		0.22	0.20		0.34	*0.02	
20		0.79		0.09			0.09				*0.01	
21		*0.05						0.26			0.04	*0.02
22				0.12						0.35		*0.14
23							0.40			0.19	0.16	
24	0.20	0.55	*0.32				1.15		0.47	0.24	0.01	
25	0.06	0.60	*0.76				0.45			0.10	*0.72	*0.19
26		*0.03	*0.02	0.05		0.11	0.03				*0.13	*0.09
27			*0.10					0.05				*0.01
28	*0.02	*0.02		0.12	0.40	0.25			0.33	0.05		*0.04
29					0.13	0.05				0.02		*0.01
30	*0.25			0.37			0.32	0.25				
31	*0.07											
Total	3.72	5.24	3.37	2.76	3.88	3.63	3.79	3.71	2.15	2.76	2.07	1.83

* Snow.

Daily Precipitation, in Inches, at Graefenburg, near Utica, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1			0.18	0.07		0.04			0.70			*0.15
2			*0.05		0.38	0.09		0.38		0.05		*0.03
3	*0.04	*0.12			0.10						0.19	*0.06
4	*0.02	*0.35			0.74			0.09	0.30		0.27	*0.02
5				0.12	0.02			0.30	0.02		0.45	
6	1.05	*0.09				1.05		0.08	1.51		0.15	
7	*0.46		0.45	0.30		0.55		0.04	0.27	0.40	0.03	
8	*0.01		0.02	0.04		0.06	0.25				0.01	
9	*0.05		0.03	0.01	0.06				0.37		0.04	*0.04
10		*0.12		0.05	0.24			0.11			0.78	
11					0.10	0.22		0.50			0.02	*0.02
12		*0.25		0.35	0.01	0.50					0.06	
13		*0.25				0.13	0.13					*0.01
14	*0.01	*0.06	0.24						0.13		0.34	
15	*0.09		0.01								0.05	
16		*0.02									0.05	*0.06
17		*0.12				0.11	0.55					
18	*0.04	*0.40		0.13	0.20	0.70						*0.02
19	0.29			0.37	0.44	0.12		0.32	0.03		0.08	*0.05
20				0.04			0.03				0.01	
21		*0.10	0.18		0.56							*0.03
22	0.27	*0.01		0.07	0.02		0.11			0.09	0.03	
23					0.01		0.13	0.02			0.02	
24		*0.40							0.11	0.20	0.08	0.39
25	*0.01				0.90		0.51		0.35	0.12		*0.02
26				0.87	0.48		0.24	0.31	1.48	0.09	0.15	
27	*0.01	0.13					0.02			0.25		*0.06
28	*0.25	1.02			0.13	0.35	0.65		0.60	0.32		
29	*0.02										0.12	*0.19
30	*0.32			0.07	0.19		0.11			0.05	0.14	0.30
31	*0.03		0.02		0.58							
Total	2.97	3.44	1.18	2.49	5.16	3.92	2.73	2.15	5.87	1.57	3.07	1.45

* Snow.

Daily Precipitation, in Inches, at Deerfield Reservoir, near Utica, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1	0.03		0.02		0.22			0.02	0.14	0.30		
2		0.02	0.05		0.97				0.03	0.20		
3		0.07		0.11	0.08		0.52			0.02	0.03	
4	0.07		0.03		0.09						0.07	
5	0.01		0.31		0.03	1.23			0.48		0.04	T
6	0.30		0.04		0.05	0.29			0.10		0.05	
7		0.07		0.34	0.25			0.04			T	
8			0.07		0.19						0.25	*0.14
9				0.13							0.31	*T
10	0.05	0.06	0.33	0.22	0.14			T	T			*0.02
11	0.10	0.44	0.11		0.69	0.71			0.42			*0.05
12	0.08	0.01	0.02							0.47		
13	0.30							0.01				
14	0.05		0.04	0.99	0.05	0.35						0.63
15	0.32	0.60	0.01	0.41	0.10					T	0.01	*0.04
16		1.43		0.01	0.48			1.31	0.28	T		*0.03
17	0.35	0.29	0.05	0.03	0.32		0.10	0.38	0.03	0.59	0.30	*0.02
18	0.26		0.05	0.08	0.16	0.57		0.13		0.05	*0.02	*0.07
19			0.08	0.09	0.04	0.05	0.28	0.15		0.35	*0.03	*0.04
20		0.93		0.13			0.20	0.01			*0.02	*T
21		0.01	0.03					0.27				*T
22				0.12						0.58	*0.17	*0.06
23						0.01	0.48			0.18	0.25	*0.04
24	0.45	0.41					1.28		0.70	0.15		
25	0.01	0.66	0.25		0.02		0.20			0.04	*0.76	
26			0.86							T	*0.15	*0.14
27								0.11				*T
28			0.10		0.47	0.11			0.27	*0.28		*0.01
29					0.21					*T	*0.07	*0.03
30	0.25						0.01	0.29	0.01			*0.01
31	0.07											
Total	2.70	5.03	2.45	2.66	4.56	3.32	3.07	2.72	2.46	3.21	2.53	1.36

* Snow. T means trace.

Daily Precipitation, in Inches, at Deerfield Reservoir, near Utica, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1			0.22	0.04		0.02			0.41	T		*0.15
2			0.04		0.37	0.19		0.22		T		*0.01
3	*0.10	*0.09			0.08						0.21	*0.01
4	*0.01	*0.30		0.01	0.73			0.25	0.86		0.51	*0.02
5		*0.02		0.05				0.28	0.02		0.42	*0.02
6	*1.43	*T				0.99		0.42	1.21	0.15	0.13	
7	*0.30		0.45	0.33		0.45		0.02	0.07	0.56	*0.19	
8	*T		*T	*0.10		0.01	0.84			0.01	*0.04	*0.03
9			*0.03	0.04	0.04				0.13	0.04	*0.04	*0.01
10	*0.04	*0.13		0.04	0.29	0.06		0.21		0.06	*0.92	
11		*T			0.13	0.35	0.41	1.08			T	
12		*0.18		*0.37	T	0.43					*0.02	*0.02
13		*0.15				0.08	0.21				*0.09	
14	*0.03	*0.03	*0.21						0.21		*0.12	*0.02
15	*0.03	*0.01	*T								*0.01	
16		0.03	*T					0.03			*0.05	*0.05
17		*0.11				0.04	0.64				*T	*0.02
18	0.16	*0.59		0.09	0.35	0.40						*0.03
19	0.31	*T		0.18	0.36	0.13		0.90	0.06		*0.09	*0.04
20	*0.03			0.26			0.23					*0.05
21		0.10	0.16		0.87							*0.03
22	0.16	*0.02			T		0.49		0.04	0.13	*0.06	
23		*0.41	T	T			0.55			0.40	0.03	
24		*0.01							0.12	0.06	0.12	*0.33
25	*0.12				0.86		0.50		0.34	0.16	0.03	*0.07
26				0.71	0.37		0.10	0.35	0.54	0.14	*0.08	*0.01
27	*0.12	*0.05		0.03			0.06			0.28		*0.07
28	*0.05	*1.36			0.14	0.12	0.32		1.28	0.30		
29	*0.05								0.02	0.06	*0.14	*0.33
30	*0.31			0.08	0.12		0.22				*0.13	*0.53
31	*0.05		0.15		0.96		T					*0.01
Total	3.30	3.59	1.26	2.33	5.67	3.27	4.57	3.76	5.31	2.35	3.43	1.86

* Snow. T means trace.

Daily Precipitation, in Inches, (July to December, inclusive) at Trenton Falls, N. Y.

DAY.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.						
1						0.35
2			0.05			0.05
3			0.15	0.22		0.15
4					0.12	
5		0.02				0.48
6	1.34	0.78			0.06	
7		0.05	0.44		0.38	0.27
8	0.54					0.45
9		0.26			0.13	0.01
10						0.04
11				0.69	0.23	
12				0.02	0.48	1.12
13	0.24	0.15			0.13	0.04
14		0.01				T
15	0.01				0.41	0.57
16					T	
17					0.23	
18	2.10	1.13			0.11	0.05
19	0.25	0.40			0.02	0.07
20		0.05			0.18	0.10
21						0.16
22	0.55					0.21
23		0.06				
24			0.02			
25	0.24			0.06		
26	0.21			0.02	0.03	0.31
27				0.13	0.02	0.01
28				0.11	0.04	T
29			1.37	0.58		
30						
31						0.89
Total	5.48	2.91	2.03	1.83	2.57	5.33

T means trace.

Daily Precipitation, in Inches, at Trenton Falls, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1	T				0.16				0.31	0.82		
2	T		0 15		0.94				0.03	0.07		
3	T	0.10		0.12	0.07	T	0.75			0.03	0.09	
4	0.04				0.09		0.04				0.10	
5			0.20			1.15			1.14			
6	0.90	0.38	0.07			0.78			0.08		T	T
7	T			0.38	0.22			0.30				
8			0.15	T	0.02							0.37
9				0.14							0.40	T
10	0.10	0.23	0.36	0.40	0.21							0.04
11	0.12	0.45	0.16		0.73	0.73	0.04		0.27			0.01
12	0.04	0.02	T				0.10			0.60		
13	0.23											0.05
14	0.06	T	0.10	0.80	0.14	0.47						0.60
15	0.23	0.85	T	0.38							T	0.16
16		1.38			0.24		T	1.20	0.32	0.03	T	0.05
17	0.57	0 37	0.10	0.11	0.40		T	0.22		0.67	0.68	0.02
18	0.22	T	0.05	0.14	0.12	0.50	T	0.29		0.07	0.03	0.05
19			T	0.08	T	0.16	0.36	0.02		0.20	0.02	0.18
20	T	0.90	0.10	0.10		T	0.02				0.05	T
21		T						0.25				
22			T	0.28	T		T			0.68	0.13	0.01
23	T		T		T		0.35			0.11	0.28	0.01
24	0.60	0.46					1.50		0.69	0.14		T
25		0.94	0.43				0.31				0.60	
26		T	0.95	0.19							0.05	0.25
27			0.02					0.15				T
28	0.10	T	0.25	0.45	0.50				0.32	0.28		0.05
29	T				0.13					T	0.08	T
30	0.37		T	0.47				0.16				
31	0.01						T			T		
Total	3.59	6.08	3.09	4.04	3.97	3.79	3.47	2.59	3.16	3.70	2.51	1.85

T means trace.

Daily Precipitation, in Inches, at Trenton Falls, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1			0.21	0.14		T			0.19	T		*T
2	T		T		0.20	0.12		0.05		0.03		
3	0.18	0.35			0.28				0.98			*T
4	0.04	0 50			0.47			0.60	0.03		0.66	*T
5		0.05		T				0 54	0.30		0.23	*0.10
6	1.01	T		T		1.30		0.10	0.75	0.27	0.07	
7	0.40		0.45	0.19		0.71				0 67	0.28	
8	T		T	0.14		0.03	0.88				0.10	*0.05
9		T	0.02	T	0.01				T	T	T	*0.02
10	0.02	0 41	T	T	0.18	0.05		0.36		0.14	0.70	
11		T			0.17	0.32	0.45	1.37			0.05	
12		0.41		0.39		0.34					T	
13		0.20					0.28				0.10	
14		0 05							0.30		0.12	*T
15	0.09	0.06									T	
16		T	T									*T
17		0.13					0.60					
18	0.35	0.43		0.29	0.83	0.50						
19	0.78	T		0.21	0.42	0.20		0 81			0.05	*0.42
20	T			0.09			0.29					
21		0.35	0.25		1.00							*0.27
22	0.12	T					0.67		0.11	T	0.10	
23	T	0.40	T				0.16			0.54	T	
24		0.02									0.25	T
25	0.17				0 83		0.27		0.48	0.10	T	0.39
26				0.80	0.36		T	0.37	1.30	0.27	0.12	*T
27	0.15	0.22					0.19		0.03	0.19		*0 13
28	T	1.81			0.16	T	1.40		1.48	0.48		
29	0.03			0.04						0.19	0.25	0.50
30	0.30				0.67		0.32				0.20	0.43
31	0.06		T		0.62							
Total	3.70	5.39	0.93	2.29	6.20	3.57	5.51	4.20	5.95	2.88	3.28	2.31

* Snow. T means trace.

Daily Precipitation, in Inches, at Twin Rock Bridge, near Grant, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1			0.24	0.10					0.38			
2			0.04		0.36	0.11				0.12		
3	*0.20	*0.23			0.09						0.30	
4	*0.07	*0.35			0.68			0.36	0.76		*0.20	
5		*0.06						0.51	0.07		0.20	
6	*0.92					1.27		0.10	0.25	0.35	0.05	
7	*0.40		0.55			0.85		0.02	0.38	0.60	*0.11	
8				0.04		0.10	0.61				*0.07	
9									0.09			*0.16
10		*0.37			0.30					0.12	*0.70	
11					0.14	0.25	0.90	1.45			0.14	
12		*0.28		0.43		0.22		0.19			*0.08	
13		*0.13				0.16	0.32					
14		*0.29	0.24						0.18		*0.12	
15	*0.02	*0.07									*0.05	
16												*0.12
17		*0.21				0.06	0.49					
18	*0.20	*0.54		0.20	0.75	0.46						
19	1.41			0.32	0.51	0.14		0.55				*0.24
20				0.12			0.09		0.04			
21					1.00							*0.05
22							0.40		0.02		*0.14	
23		*0.48					0.16			0.46		
24		*0.09									*0.16	*0.75
25	*0.15				0.80		0.15		0.39	0.12	*0.07	
26				0.73	0.25			0.30	1.81	0.30	*0.07	
27		0.41					0.04			0.09		*0.08
28		2.33			0.10	0.06	1.20		1.80	0.51		
29										0.25	*0.23	*0.48
30	*0.46				0.72		0.40				*0.19	*0.88
31			0.09		0.28		0.04					
Total	3.83	5.84	1.16	1.94	5.98	3.68	4.80	3.48	6.17	2.92	2.88	2.76

* Snow.

Daily Precipitation, in Inches, at Gray, N. Y.

DAY.	Sept.	Oct.	Nov.	Dec.
1908.				
1				0.13
2	0.06	0.26		0.03
3	0.12	0.02		0.02
4			0.15	
5				0.33
6			0.05	
7	0.60		0.10	0.17
8				0.71
9			0.26	0.05
10		0.02		
11		0.63	0.28	0.04
12		0.07	0.26	0.42
13			0.12	0.04
14				0.01
15			0.29	0.46
16				
17			0.08	
18			0.08	0.03
19	0.03			0.14
20			0.24	0.12
21				0.07
22				0.03
23				
24	0.02			
25		0.04	0.10	0.15
26		0.06	0.02	0.10
27		0.17	0.07	
28		0.06	0.05	0.01
29	1.77	0.78		
30				
31				0.84
Total	2.60	2.11	2.15	3.90

Rain gage installed September, 1908, at the upper Gray reservoir of the Consolidated Water Co. of Utica, N. Y.

Daily Precipitation, in Inches, at Gray, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1	0.02				0.75				0.20	0.55		
2		0.07	0.23		0.52				0.09	0.22		
3				0.21	0.03		0.85			0.05	0.26	
4	0.07				0.27		0.09			0.02	0.12	
5	0.01		0.28			1.25			1.01			
6	0.75	0.33	0.11			0.86			0.08			
7		0.20		0.39	0.51			0.26				
8			0.18								0.04	0.42
9				0.08							0.37	
10			0.21	0.40	0.17							0.08
11	0.21	0.56	0.33		0.89	0.99	0.08		0.39			
12		0.06								0.55	0.04	
13	0.54	0.09										
14			0.08	0.89	0.07	0.57						0.57
15	0.18	0.69		0.54						0.05		0.12
16		1.50		0.06	0.25		0.76	1.11	0.17			0.11
17	0.28	0.63	0.14	0.13	0.50		0.25	0.79	0.02	0.94	0.71	0.06
18	0.34		0.01	0.13	0.06	0.62	0.01	0.41		0.16		
19				0.06	0.07	0.23	0.39	0.08		0.17		0.07
20		1.12	0.09	0.09			0.03					
21		0.07						0.17				
22				0.29						0.61	0.39	0.04
23							0.19			0.15	0.50	
24	0.50	0.56					1.39		0.45	0.18		
25	0.28	1.19	0.37				0.51				0.44	
26			1.02	0.15			0.01				0.04	0.11
27			0.15					0.13				
28	0.08		0.23	0.47	0.60				0.43	0.10		0.05
29					0.12							
30	0.28							0.29				0.04
31							0.02					
Total	3.54	7.07	3.43	3.89	4.81	4.52	4.58	3.24	2.84	3.75	2.91	1.67

Daily Precipitation, in Inches, at Gray, N. Y.

DAY	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1			0.24	0.11					0.27			0.05
2	0.06		0.10		0.35	0.22		0.03		0.12		
3	0.11	0.15									0.37	
4		0.38			0.77			0.06	0.83		0.27	0.02
5		0.04		0.10				1.01	0.01	0.03	0.23	
6	1.10					1.09		0.08	0.60	0.23	0.05	
7	0.33		0.49	0.24		0.39		0.04	0.73	0.37	0.13	
8				0.03		0.21	1.23				0.07	0.05
9			0.06						0.08	0.03		0.02
10	0.03	0.34			0.12	0.23				0.14	0.65	
11		0.04			0.16	0.20	1.25	1.34			0.20	
12		0.11		0.35		0.40		0.52			0.09	
13		0.18				0.26	0.23					
14		0.05	0.16						0.28		0.10	
15	0.03	0.04									0.05	
16		0.05										0.02
17		0.10				0.08	0.55					
18	0.07	0.46		0.21	0.52	0.58						0.02
19	0.95			0.47	0.88	0.05		0.72	0.06		0.05	0.22
20				0.14			0.01					0.07
21		0.45	0.38		0.94							0.08
22	0.29				0.01		0.44				0.10	
23		0.34					0.38			0.62		
24		0.03								0.06	0.23	0.73
25	0.14				1.14		0.85		0.86	0.13	0.08	0.02
26				1.66	0.34		0.03	0.28	1.49	0.32	0.09	
27	0.13	0.28		0.70			0.06			0.20		0.07
28		2.00			0.28	0.10	0.49		1.58	0.72		
29	0.16									0.09	0.24	0.60
30	0.22			0.03	0.23		0.35				0.18	0.99
31	0.06		0.32		0.24		0.06					
Total	3.68	5.04	1.75	4.04	5.98	3.81	5.93	4.08	6.79	3.06	3.18	2.96

Daily Precipitation, in Inches, at Hoffmeister, N. Y.

DAY.	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
1910.												
1					0.55	0.15		0.07		0.70		
2	(*0.42)							0.80			0.35	T
3		*0.87	*T		0.98			1.63	0.90			(*0.09)
4				T				T		(0.35)	*T	
5		T				0.50		(0.50)	(0.93)		(0.83)	
6	(*1.82)			(*0.06)		0.15						
7			(*0.47)			0.08	0.70	T			*0.02	
8											*T	*0.08
9		(*0.47)	T		T				0.10	0.05	*T	
10					0.43		1.37	1.80			*T. 0.56	
11	*T			*T		(0.94)						
12							T				*T	
13		(*1.10)	(*0.18)						0.12		(*0.28)	
14	*T					T						(*0.25)
15		*T								T	*T	
16		(*0.83)	*T			(0.92)	0.51				*T	
17											*T.	*0.10
18	(*1.44)			(*a*)	1.13	T		0.50	T		(*0.35)	
19							0.45					(*0.44)
20			T									
21	0.88	0.24			0.75		T		0.17			
22		(*0.53)					0.59			0.48	T	
23						T		0.80		T		(*1.04)
24	*0.28				0.96				(1.97)		*0.22	
25				1.46	0.36		(0.53)			1.00		
26				0.22	T			0.16				T
27	(*0.47)	0.81			T	T	1.80		2.42	(0.80)		
28		T										*0.58
29	(*0.45)			0.07							(*0.52)	1.09
30			0.10		0.39		0.37	T				*T
31	*T		T					T				
Total	5.76	4.85	0.75	1.81	5.55	2.74	6.32	6.26	6.61	3.38	3.13	3.67

* Snow. T means trace. *a* Can leaked.

Table showing Water Equivalent of Accumulated Snow on Ground at Hoffmeister, N. Y.

DATE.	Snow in inches.	Water in inches.	DATE.	Snow in inches.	Water in inches.
1909.			1910.		
Dec. 13	8.5	1.7	Feb. 7	35.5	7.9
Dec. 20	21.0	2.8	Feb. 14	53.5	6.6
Dec. 27	24.0	4.4	Feb. 21	46.0	7.6
			Feb. 28	42.0	11.8
1910.			March 7	34.0	6.9
Jan. 3	25.0	3.6	March 14	35.0	11.1
Jan. 10	32.5	5.1	March 21	30.0	9.0
Jan. 17	28.0	6.8	March 28	18.0	5.4
Jan. 24	27.0	5.0			
Jan. 31	34.0	6.4			

Daily Precipitation, in Inches, at North Lake, near Atwell, N. Y.

DAY.	Jan. *a*	Feb. *a*	Mar. *a*	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec. *a*
1910.												
1					1.40	0.15						
2				*0.40	0.45						0.74	
3									0.93	0.50		
4								0.30			0.14	
5						0.68			0.52			
6						0.27		0.50	0.82			
7				0.28		0.78	0.30					
8				*0.20								
9												
10				0.16				1.32			0.75	
11						0.41		0.03				
12						0.12						
13							0.20		0.25	0.75		
14												
15							0.65				*0.10	
16												
17					0.67							
18				1.28	0.30	1.25		0.10				
19							0.14	0.42				
20				0.20	0.60							
21											*0.15	
22							0.65					
23											*0.15	
24					1.46							
25							0.34		0.45			
26				1.10	0.20		0.21		1.00			
27						0.23						
28												
29					1.02						*0.20	
30											*0.10	
31								0.25				
Total				3.62	6.10	3.89	2.49	2.92	3.97	1.25	2.33	

a Record not available. * Snow.

UPPER HUDSON RIVER DRAINAGE BASIN.

DESCRIPTION.

Upper Hudson river comprises the drainage basin above tide-water influence at Troy and also above the mouth of Mohawk river at Waterford.

The head-water region is mountainous in character, in general heavily wooded, and dotted with numerous lakes and ponds. The rocks, belonging to the oldest formation and mainly granite, are either bare or covered with only a layer of spruce duff, humus and forest litter. The river emerges from the mountain region a few miles west of Glens Falls, and thence to Troy the topography is moderately rolling and the surface soil is chiefly sand.

The fall in the upper portion of the course is very rapid, amounting to about 64 feet per mile from Lake Tear-of-the-Clouds to North creek, a distance of about 52 miles. From the mouth of North creek to the mouth of the Sacandaga the descent is nearly 14 feet per mile, distributed among rapids which diminish in frequency as the Sacandaga is approached. In the succeeding 26 miles to Fort Edward the river descends 418 feet more, but of this 175 feet is comprised within the three abrupt pitches at Palmer, Glens and Bakers falls, while most of the remainder occurs in the rapids between Jessups Landing and the oxbow above Glens Falls. Between Glens Falls and Troy nearly the entire fall of the river is utilized for the development of water-power.

The flow of the upper Hudson is controlled to some extent during the dry season by the use of Indian lake storage reservoir, and the facilities for storage works in this part of the basin are unsurpassed. The entire region is dotted with ponds and lakes, many of them of large size and fed from extensive drainage areas. Saratoga lake serves as a regulator of Fish creek, and there is a small reservoir at the head waters of the Hoosic.

UPPER HUDSON RIVER WATER-SURFACE ELEVATION RECORDS.

The following tables give records of the mean daily elevation of water-surface for 1910. The elevations are referred to Barge canal datum.

The tables of elevations of water-surface are arranged in order, proceeding up-stream from the State dam at Troy to Glens Falls.

An accompanying table gives details as to the types of gages used, the datum of each and the manner in which readings are taken.

Water-surface Elevation Gages Maintained on the Hudson River and Tributaries During the Year 1910.

STREAM.	Location.	Date established.	Observer.	Elevation of zero mark (B. C. datum).	Type of gage.	Sub-division of gage.	Readings taken to	USUAL TIME OF READING	
								A. M.	P. M.
Hudson river....	Below dam, Troy............	Jan. 19, 1903	John B. Mackey..........	—0.09	Staff...	1/10 Foot	1/10 Foot	7	5
	Above " "	Jan. 19, 1903	" " "	9.27	Staff...	1/10 Foot	1/10 Foot	7	5
	Below H. R. E. P. Co.'s dam, Mechanicville............	Aug. 18, 1905	Herbert C. Tinker.........	43.00	Staff...	1/10 Foot	1/10 Foot	8	5
	Above H. R. E. P. Co.'s dam, Mechanicville..........	Aug. 18, 1905	" " "	29.00	Staff...	1/10 Foot	1/10 Foot	8	5
	Toll bridge, Mechanicville.....	Aug. 16, 1905	Wm. E. Downing..........	48.77	Staff...	1/10 Foot	1/10 Foot	8	5
	B. & M. R. R. bridge, Mechanicville......................	Aug. 15, 1905	W. D. La Bar, to July 15 James Steen, after July 15	66.50	Staff...	1/10 Foot	1/10 Foot	8	5
	Below dam, Stillwater.........	July 15, 1909	Thomas E. Hickey........	74.73	Staff...	1/10 Foot	1/10 Foot	7	5
	Highway bridge, Stillwater.....	Aug. 1, 1908	" " "	81.29	Staff...	1/10 Foot	1/10 Foot	7	5
	Toll bridge, Schuylerville.......	Aug. 14, 1905	H. C. Funston...........	81.50	Staff...	1/10 Foot	1/10 Foot	8	5
	Free bridge, Liberty Mills......	Oct. 23, 1905	Wm. B. Dunston..........	83.12	Chain..	1/10 Foot	1/10 Foot	6:30	5:30
	Above dam, Northumberland...	April 11, 1904	Geo. Hammond...........	100.58	Chain.	1/10 Foot	1/10 Foot	8	5
	Hill St., Fort Miller..........	April 11, 1904	Leon C. Brazier..........	99.87	Staff...	1/10 Foot	1 00 Foot	8	5
	Below dam, Fort Miller........	May 1, 1904	" " "	104.08	Staff...	1/10 Foot	1/10 Foot	8	5
	Above Fort Miller..........	April 11, 1904	" " "	113.75	Staff...	1/10 Foot	1/10 Foot	8	5
	Above Crocker's Reef dam.....	April 11, 1904	John H. Donnelly, Jr......	114.86	Staff...	1/10 Foot	1/10 Foot	7	5
	Mouth of Moseskill..........	Dec. 1, 1906	Thomas B. Sanders........	119.00	Staff..	1/10 Foot	1/10 Foot	6	7
	Snookkill, near Fort Edward...	April 11, 1904	Benj. Metcalf..........	114.85	Staff...	1/10 Foot	1/10 Foot	8	5
	Bridge St., Fort Edward.......	April 11, 1904	Benj. F. Thebo...........	117.84	Staff...	1/10 Foot	1/10 Foot	8	5
	Below I. P. Co.'s dam Fort Edward..................	1906	F. E. Chapman..........	121.47	Staff...	Inch.....	Inch.....	A. M.	.....
	Above I. P. Co.'s dam, Fort Edward..................	1906	" "	139.83	Staff...	Inch.....	Inch.....	A. M.	P. M.
	Glens Falls	Mar. 9, 1905	Albert B. Fisher..........	273.87	Staff...	1/10 Foot	1/10 Foot	8	6
	Corinth.....................	Oct. 1, 1906	E. H. Bowker..........	*	Staff...	1/10 Foot	1/10 Foot	8	5
Hoosic river.....	Eagle Bridge..............	Dec. 11, 1908	H. J. Speanburgh........	*	Chain..	1/10 Foot	1/10 Foot	7	5
" "	Hoosick Falls...............	April 3, 1904	Sanford L. Cluett.........	*	Staff...	1/10 Foot	1/10 Foot	7	5
Sacandaga river..	Northville	Feb., 1904	P. C. Pickard............	*	Staff...	1/10 Foot	1/10 Foot	8	.....

* Arbitrary datum.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River below State Dam at Troy, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	2.51	5.91	20.11	10.76	6.86	7.51	2.81	2.51	3.76	6.31	4.51	4.11
2	2.81	5.71	21.36	12.16	6.41	7.31	2.56	2.66	3.51	4.36	4.91	3.86
3	2.96	5.31	20.91	12.66	6.16	7.21	3.81	2.91	3.31	4.16	4.71	3.86
4	2.81	5.41	19.36	11.31	6.31	6.81	3.61	2.31	5.31	4.81	3.51	3.86
5	2.51	5.11	17.66	10.31	5.86	6.91	4.01	2.51	5.76	4.31	3.31	3.71
6	2.86	5.01	14.91	9.66	7.61	7.81	4.96	2.31	5.61	4.01	3.91	3.36
7	3.71	5.11	15.11	9.76	7.61	10.01	5.21	3.71	5.86	3.51	5.01	3.31
8	3.41	5.06	16.06	9.81	6.71	10.16	5.11	3.51	5.91	4.01	4.81	3.41
9	4.51	5.16	13.16	9.66	6.91	9.26	5.26	3.21	5.96	3.51	4.61	3.11
10	3.51	5.21	11.26	8.66	6.81	8.01	3.36	3.41	5.81	2.91	3.66	3.41
11	3.46	5.16	10.81	7.81	6.11	8.06	2.46	2.21	4.76	2.91	3.66	3.41
12	3.61	5.16	9.91	7.21	5.26	7.96	1.76	1.61	5.46	2.61	3.66	3.61
13	4.21	3.81	8.91	6.71	5.01	8.51	1.71	1.96	5.51	2.91	4.21	3.76
14	3.71	3.91	8.71	6.26	4.46	7.41	1.01	3.41	5.26	3.66	4.61	3.71
15	3.56	4.31	8.11	5.71	3.46	6.61	1.96	3.41	5.21	3.51	4.71	3.76
16	3.51	4.41	6.81	5.76	3.71	5.91	2.11	3.61	4.76	3.76	4.01	3.51
17	3.31	4.81	6.16	5.51	3.96	5.71	2.26	3.51	5.61	4.01	4.06	3.56
18	4.01	4.86	5.46	6.01	4.51	5.51	3.31	4.31	4.61	4.71	4.66	3.36
19	4.51	4.66	5.01	7.71	4.31	7.31	3.86	4.06	4.46	5.01	3.51	3.61
20	4.61	4.66	6.11	8.61	4.81	7.31	4.31	4.41	5.01	4.96	3.36	3.61
21	5.31	4.61	8.31	8.91	5.01	6.66	5.26	4.66	4.46	3.56	3.51	3.51
22	13.11	4.81	9.16	8.21	5.76	5.96	4.86	4.76	3.66	3.46	3.26	3.21
23	12.31	4.56	9.66	7.31	6.21	5.76	5.21	4.06	3.66	2.96	3.56	3.36
24	13.91	4.36	9.86	7.51	6.11	5.16	3.71	3.56	3.61	2.71	3.61	3.56
25	12.06	4.71	10.61	7.41	5.76	4.81	3.96	3.26	2.61	3.21	3.61	3.61
26	10.16	4.51	10.36	7.11	7.66	4.36	3.11	1.76	2.86	3.11	3.56	3.56
27	9.26	6.26	10.66	7.51	8.66	3.21	2.61	1.96	2.96	4.01	3.61	3.76
28	8.16	13.06	10.16	12.21	8.71	2.66	2.51	1.86	3.86	4.01	3.71	4.11
29	7.41	......	9.81	9.51	6.56	2.61	2.11	2.31	4.71	3.96	3.51	4.56
30	6.66	......	9.41	8.11	6.31	2.81	2.51	2.06	6.41	4.31	3.56	4.71
31	6.31	......	9.31	......	7.16	......	2.66	2.26	.....	4.01	......	4.66

Mean Daily Elevation of Water-surface (Barge Canal Datum) at Hudson River above State Dam at Troy, N. Y.

DAY.	Jan.*a*	Feb.*a*	Mar.*a*	April.*a*	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	......	......	......	......	*a*	15.37	13.37	14.47	14.27	15.97	15.17	14.97
2	......	......	......	......	*a*	15.22	13.32	14.37	14.12	15.57	14.97	15.02
3	......	......	......	......	*a*	14.97	12.62	14.27	13.92	15.37	15.12	14.87
4	......	......	......	......	*a*	14.82	13.27	14.22	13.97	15.17	14.97	15.02
5	......	......	......	......	*a*	14.72	13.07	14.32	14.17	15.02	15.17	14.77
6	......	......	......	......	*a*	15.47	12.87	14.42	13.67	14.87	15.52	14.12
7	......	......	......	......	*a*	16.67	12.82	15.17	13.57	14.77	16.12	14.42
8	......	......	......	......	*a*	16.77	12.77	15.02	13.57	14.67	16.07	14.37
9	......	......	......	......	*a*	16.27	12.82	14.82	13.17	15.17	15.52	13.97
10	......	......	......	......	*a*	15.87	13.32	14.67	13.57	15.12	15.47	13.82
11	......	......	......	......	*a*	15.52	13.37	14.72	13.62	14.92	15.77	14.42
12	......	......	......	......	*a*	15.87	13.57	14.67	13.77	14.47	16.07	14.47
13	......	......	......	......	*a*	15.97	13.37	14.67	13.97	14.07	16.12	12.82
14	......	......	......	......	*a*	15.37	13.87	15.47	13.87	13.77	15.77	12.57
15	......	......	......	......	14.02	15.22	14.67	15.02	13.77	13.77	15.37	12.72
16	......	......	......	......	13.97	14.97	14.57	15.17	13.87	14.17	15.22	13.57
17	......	......	......	......	13.87	14.82	14.52	14.67	13.87	13.77	15.02	13.12
18	......	......	......	......	13.72	14.67	14.62	14.47	14.77	13.57	14.92	14.62
19	......	......	......	......	13.72	15.42	14.27	14.52	14.57	13.22	14.72	15.17
20	......	......	......	......	13.77	15.27	14.37	14.42	14.42	14.17	15.17	14.72
21	......	......	......	......	13.87	14.77	14.07	14.67	14.42	14.32	14.87	14.67
22	......	......	......	......	14.42	14.52	14.22	14.42	14.37	14.12	15.07	13.72
23	......	......	......	......	14.52	14.22	13.97	14.47	14.02	14.82	15.12	13.92
24	......	......	......	......	14.47	13.97	14.62	14.57	14.12	14.72	14.97	13.97
25	......	......	......	......	14.32	14.02	14.77	14.22	14.62	14.82	14.87	14.57
26	......	......	......	......	15.22	13.82	14.12	14.02	14.82	14.92	14.82	14.77
27	......	......	......	......	16.22	13.87	14.37	13.92	14.47	14.77	14.77	14.97
28	......	......	......	......	16.02	13.52	14.47	13.87	15.42	14.87	14.82	14.97
29	......	......	......	......	15.47	13.42	14.52	14.02	15.82	14.67	14.72	14.92
30	......	......	......	......	15.92	13.37	14.52	13.77	16.17	14.77	14.72	15.02
31	......	......	......	......	15.92	......	14.47	13.77	.....	14.62	......	14.87

a No record.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River below Dam of Hudson River Electric Power Co., near Mechanicville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1919												
1	30.35	31.50	36.60	36.95	32.85	33.65	30.80	30.20	30.65	31.90	31.55	31.25
2	30.20	31.25	36.55	37.00	32.85	33.40	30.85	30.55	30.65	31.00	31.45	31.15
3	30.25	30.95	36.25	37.70	32.70	33.35	30.45	30.40	30.65	31.70	31.55	31.00
4	30.20	30.95	36.20	36.05	32.50	32.80	30.15	30.35	30.40	31.35	31.65	30.80
5	30.30	30.85	36.00	35.35	33.15	32.25	30.65	30.60	30.70	31.15	31.55	31.00
6	30.55	30.65	35.55	34.95	33.15	33.10	30.60	30.65	31.00	31.10	31.80	31.20
7	30.80	31.25	36.05	34.90	32.75	33.95	30.45	30.55	31.10	31.50	32.45	31.35
8	30.75	31.05	35.95	34.85	32.20	34.10	30.40	30.70	31.25	30.70	32.60	31.55
9	30.30	31.00	35.30	34.75	32.40	34.00	30.40	30.85	31.20	30.65	31.80	30.65
10	30.50	30.75	34.85	34.10	32.35	33.75	30.30	30.50	31.10	31.25	31.55	30.65
11	30.70	31.50	34.45	33.70	32.25	33.60	30.45	30.75	31.10	31.30	31.75	30.45
12	30.50	31.60	34.10	33.20	32.05	33.50	30.25	30.60	31.35	31.15	31.65	30.65
13	30.70	31.25	33.90	33.10	31.55	33.55	30.45	30.55	31.85	31.00	30.80	30.65
14	30.60	31.35	33.90	33.00	31.20	33.15	30.30	30.50	31.05	31.10	31.85	30.70
15	30.35	31.55	33.45	32.25	31.05	32.85	30.30	31.05	31.10	31.10	31.60	30.65
16	30.55	31.10	33.10	32.15	31.50	32.45	30.25	30.90	31.10	30.75	30.70	30.80
17	30.75	31.15	32.80	31.90	31.20	32.20	30.25	30.65	30.85	31.00	31.55	30.85
18	30.75	31.65	32.50	31.95	31.10	32.20	30.55	30.70	30.55	31.05	31.40	30.45
19	32.75	31.65	32.10	32.30	31.10	32.15	30.45	30.75	30.85	30.80	30.35	30.60
20	32.00	30.75	32.25	33.30	31.15	32.45	30.30	30.80	30.90	30.90	30.60	30.80
21	31.75	31.35	32.90	34.30	31.20	31.90	30.25	30.50	30.85	30.70	30.95	30.80
22	36.50	32.15	33.00	33.50	30.75	31.55	30.20	30.65	30.85	31.00	31.50	31.05
23	34.75	32.50	33.05	33.00	31.50	31.55	30.30	31.00	30.80	30.80	30.90	30.90
24	33.10	31.80	33.35	33.00	31.60	31.20	30.25	30.50	30.65	30.95	31.00	30.85
25	32.65	31.85	34.05	32.75	31.50	31.00	30.45	30.55	30.45	31.40	31.05	30.70
26	32.50	31.70	35.95	32.60	32.65	30.35	30.35	30.55	30.75	31.00	31.40	31.10
27	32.40	31.65	36.00	32.70	34.00	31.15	30.35	30.90	30.60	31.15	30.90	31.45
28	31.90	36.55	35.80	33.95	33.35	30.80	30.25	30.40	30.90	31.20	31.40	31.25
29	31.60	......	35.75	33.30	33.10	30.80	30.30	30.35	31.40	31.45	31.55	31.70
30	31.45	......	36.00	32.90	33.00	30.85	30.30	30.45	32.15	31.30	31.20	31.70
31	31.65	......	36.65	......	33.60	......	30.20	30.65	.....	32.00	......	32.10

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River above Dam of Hudson River Electric Power Co., near Mechanicville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	49.20	48.20	52.10	52.50	49.70	50.20	48.20	49.25	48.90	49.05	49.20	49.25
2	48.75	47.95	52.05	52.55	49.15	49.95	48.00	48.90	49.00	49.00	49.35	49.25
3	48.45	47.75	51.80	52.50	49.40	49.85	47.85	48.20	48.50	48.55	49.05	48.85
4	49.05	47.90	51.80	51.95	49.00	49.35	47.65	48.40	48.65	49.15	49.30	48.80
5	48.75	48.05	51.75	51.40	49.65	49.05	47.70	49.45	49.30	48.45	49.40	49.00
6	49.05	48.20	51.60	51.10	49.55	49.65	47.35	49.40	49.35	49.30	49.30	49.00
7	49.15	48.10	51.95	50.95	49.25	50.35	47.95	48.50	48.20	47.75	49.40	49.05
8	49.20	48.10	51.85	51.00	48.90	50.45	48.90	49.25	49.00	50.00	49.05	49.20
9	49.10	47.85	51.20	50.85	49.15	50.30	48.95	49.10	49.25	49.60	49.20	48.80
10	49.10	48.00	50.90	50.55	49.10	50.20	48.45	49.35	49.25	49.40	49.20	49.10
11	49.10	47.85	50.40	50.05	48.98	49.95	49.05	49.25	49.05	49.25	49.10	49.20
12	48.75	47.70	50.30	49.70	48.75	50.20	48.80	48.95	49.25	49.10	49.20	49.15
13	49.10	48.00	50.30	49.60	48.25	50.05	48.35	49.15	49.00	49.25	49.05	48.90
14	48.75	48.10	50.20	49.40	48.20	49.75	49.30	48.05	48.85	49.15	49.25	48.75
15	49.30	47.75	49.80	48.75	48.40	49.55	48.05	49.50	49.15	49.35	49.20	49.00
16	48.85	48.10	49.45	48.60	48.45	49.25	48.60	49.10	49.10	48.90	49.00	49.00
17	48.90	48.00	49.30	48.40	48.05	49.10	48.40	49.35	48.70	49.40	49.20	49.20
18	48.45	48.10	48.90	48.40	48.35	48.85	48.45	49.40	48.10	48.85	48.90	48.60
19	49.30	47.95	48.60	49.10	48.20	48.95	48.80	49.35	49.25	49.30	49.25	49.35
20	48.95	47.90	49.05	49.75	48.20	49.20	49.05	49.30	49.20	49.15	48.20	49.15
21	49.20	48.05	49.25	50.50	48.30	48.60	49.10	48.80	49.25	48.90	49.40	49.30
22	52.95	48.40	49.30	49.85	48.20	48.30	48.70	49.15	48.85	49.00	49.35	49.15
23	50.00	47.85	49.55	49.45	48.20	48.05	48.45	49.15	49.20	49.00	49.20	49.10
24	49.60	48.15	49.75	49.95	48.15	48.20	47.95	49.15	49.10	49.05	49.25	49.15
25	49.40	48.05	50.35	49.20	48.15	48.45	48.65	48.70	48.75	49.20	48.45	48.75
26	49.50	48.10	51.65	48.70	49.40	48.05	49.10	48.55	48.95	49.15	49.25	49.10
27	49.20	48.15	51.90	50.00	50.00	48.65	48.85	49.00	49.10	48.85	48.75	49.30
28	48.35	52.15	51.70	50.35	49.90	48.50	48.80	49.15	48.85	48.80	49.25	49.35
29	48.30	......	51.60	49.80	49.75	48.35	49.00	49.25	49.50	49.10	49.35	49.15
30	48.75	......	51.95	49.30	49.60	48.05	48.55	48.95	49.40	48.90	49.10	48.95
31	48.20	......	52.30	.....	49.80	......	48.20	49.25	.....	49.05	.....	49.05

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River at Toll Bridge, Mechanicville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	49.27	49.67	54.22	54.42	50.67	51.57	48.97	49.57	49.37	50.67	50.47	49.77
2.....	48.92	49.22	54.12	54.27	50.52	51.47	49.02	49.22	49.57	50.52	50.52	49.57
3.....	49.07	49.37	53.77	53.52	50.37	51.27	48.22	48.97	49.62	50.37	50.42	49.52
4.....	48.47	49.27	53.77	53.27	50.52	50.62	48.22	49.22	49.47	50.12	50.32	49.32
5.....	48.37	49.22	53.22	52.87	50.97	50.12	48.27	49.77	49.67	49.67	50.22	49.72
6.....	49.12	49.22	53.22	52.62	50.87	51.02	48.62	49.77	49.97	50.07	50.27	49.77
7.....	49.82	49.62	53.47	52.37	50.57	51.67	48.72	49.37	49.87	49.97	50.67	49.72
8.....	49.32	49.27	53.47	52.17	50.32	51.87	49.07	49.92	50.57	50.12	50.52	49.47
9.....	49.02	49.07	52.87	52.17	50.47	51.67	48.92	49.87	49.87	49.67	50.52	49.62
10.....	49.32	49.22	52.47	51.72	50.32	51.42	48.62	49.57	49.97	50.02	50.62	49.07
11.....	49.27	49.32	51.92	51.12	50.17	51.42	49.32	49.87	50.02	50.17	50.32	49.42
12.....	49.37	49.32	51.72	51.02	49.87	51.37	49.27	49.47	50.32	50.07	50.02	49.22
13.....	49.47	49.52	51.52	51.02	49.52	51.32	48.77	49.52	49.92	50.02	49.77	49.07
14.....	49.47	49.42	51.52	50.87	49.37	51.17	49.42	49.22	49.87	49.87	50.57	49.17
15.....	49.47	49.22	51 22	50.42	49.07	50.87	48.02	50.17	49.77	49.77	50.17	49.37
16.....	49.42	49.02	50.87	50.12	49.37	50.37	48.42	49.47	49.92	49.32	50.12	49.52
17.....	48.97	49.07	50.77	49.87	49.32	50.22	48.17	49.32	49.87	50.02	49.92	49.47
18.....	49.27	49.47	50.47	49.92	49.27	50.22	48.37	49.77	49.57	49.77	49.87	49.97
19.....	49.82	49.42	49.87	49.92	49.17	50.02	48.87	49.77	49.87	49.67	49.77	49.47
20.....	49.72	49.22	50.27	50.17	49.27	50.37	49.17	49.77	49.77	49.62	49.47	49.37
21.....	49.62	49.12	50.67	51.77	49.12	49.97	49.17	49.42	49.47	49.42	49.57	49.37
22.....	53.92	49.62	50.67	51.27	49.02	49.57	48.82	49.77	49.27	49.62	49.77	49.32
23.....	51.97	50.02	50.87	50.87	49.57	49.47	48.72	49.77	49.57	49.37	49.82	49.27
24.....	51.17	49.92	51.12	50.87	49.47	49.22	48.87	49.27	49.37	49.72	49.77	49.52
25.....	50.87	49.52	51.77	50.42	49.67	49.07	49.17	49.17	49.37	49.97	49.72	49.02
26.....	50.92	49.27	53.27	50.42	50.57	48.42	49.17	49.27	49.37	49.42	49.82	49.87
27.....	50.42	49.72	53.37	51.12	51.27	49.37	49.27	49.52	49.62	49.62	49.87	49.92
28.....	49.87	54.70	53 37	51.67	51.17	49.12	49.12	49.52	49.82	49.72	49.87	49.82
29.....	49.72	......	53.12	50.97	51.12	49.07	49.27	49.47	50.27	49.82	50.12	50.12
30.....	49.82	......	53.47	50.57	51.07	48.97	49.12	49.07	50.77	49.77	49.87	50.47
31.....	49.67	......	53.87	......	51.47	......	48.62	49.77	......	50.77	......	50.47

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River at B. & M. R. R. Bridge, Mechanicville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	66.65	68.65	72.90	73.10	70.40	70.30	67.50	67.55	67.00	68.10	67.70	67.50
2.....	67.95	68.45	73.10	73.00	69.95	70.25	66.00	67.25	67.40	68.05	67.55	67.40
3.....	66.10	68.45	72.30	73.20	69.80	70.05	67.20	66.95	67.10	68.00	67.70	66.95
4.....	66.10	67.95	72.50	72.50	69.65	69.70	68.30	67.40	67.60	67.00	67.80	68.20
5.....	64.35	67.85	72.25	72.20	70.10	69.80	67.90	67.65	68.30	66.90	67.90	67.15
6.....	65.30	68.40	72.20	71.50	69.90	69.90	67.35	67.70	67.90	67.95	69.05	67.35
7.....	65.55	68.70	72.25	71.40	69.75	70.60	66.50	68.05	68.00	67.45	68.60	66.85
8.....	65.30	68.45	72.20	71.40	69.95	70.70	66.70	67.85	67.80	66.80	68.20	66.80
9.....	67.30	68.55	71.50	71.25	69.40	70.50	67.40	67.20	67.80	67.65	68.00	66.75
10.....	66.65	68.05	71.40	71.20	69.50	70.45	67.70	67.00	67.60	67.85	67.75	67.30
11.....	66.20	68.30	71.00	70.50	69.40	70.20	67.00	67.30	68.00	67.80	67.70	67.00
12.....	66.70	68.20	70.75	70.10	69.20	70.50	66.50	66.60	67.75	67.20	67.60	66.90
13.....	66.60	68.35	71.00	70.10	68.95	70.40	66.80	67.00	67.10	67.70	68.50	66.65
14.....	66.30	68.10	70.60	69.80	68.45	70.00	66.60	68.20	66.80	67.60	68.00	66.90
15.....	66.85	67.85	70.40	69.25	69.30	69.75	66.50	67.55	67.65	67.65	67.40	67.40
16.....	68.10	68.10	70.30	69.20	68.90	69.20	66.50	67.10	67.20	67.45	67.05	66.90
17.....	66.95	68.10	69.90	69.85	68.45	69.00	67.00	67.90	66.70	67.45	67.40	67.85
18.....	66.75	68.25	70.10	69.35	68.40	69.45	66.50	67.30	67.20	66.50	67.05	67.80
19.....	68.15	68.20	69.30	69.70	68.25	69.80	67.20	67.00	67.60	67.40	67.60	67.70
20.....	67.40	68.20	70.00	70.20	68.20	69.60	67.05	67.65	66.70	67.00	67.55	67.75
21.....	67.10	68.05	69.80	70.95	68.30	68.90	66.70	66.65	66.80	66.95	67.20	67.40
22.....	72.25	68.25	70.10	70.40	68.75	68.90	66.50	67.50	66.85	66.95	67.15	67.90
23.....	70.75	68.40	70.00	69.90	68.65	68.65	66.65	67.50	67.20	67.85	66.90	67.30
24.....	69.10	68.35	70.35	71.50	68.80	68.50	66.65	67.30	67.20	68.10	67.55	67.35
25.....	69.10	68.15	70.85	69.50	68.70	68.30	66.90	67.30	67.35	67.90	66.55	67.10
26.....	68.75	68.35	72.10	69.65	69.55	68.05	67.15	67.45	67.75	67.95	68.05	69.00
27.....	68.75	69.15	72.25	70.25	70.30	68.50	67.25	67.50	67.05	67.70	67.80	68.00
28.....	69.00	70.85	72.10	70.75	70.20	67.80	67.35	66.25	67.65	67.65	67.25	67.80
29.....	68.40	......	72.10	70.00	70.40	67.70	67.35	66.50	68.00	67.50	67.50	68.10
30.....	68.70	......	72.05	69.70	70.05	67.60	67.15	67.15	68.45	68.50	67.50	67.90
31.....	68.90	......	72.65	......	70.30	......	67.15	67.20	......	68.15	......	67.20

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River below Dam at Stillwater, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.*b*	Nov.*b*	Dec.*b*
1910.												
1......	75.73	76.88	79.38	80.33	77.83	78.03	75.83	75.88	75.63	......	......	......
2......	75.63	76.78	79.68	80.33	77.73	78.08	75.73	75.83	75.63	......	......	......
3......	75.68	76.83	79.78	80.38	77.68	77.88	75.73	75.78	75.53	......	......	......
4......	75.63	76.78	79.93	79.98	77.58	77.58	75.73	75.88	75.68	......	......	......
5......	75.73	76.73	79.73	79.43	77.53	77.48	75.83	75.83	75.63	......	......	......
6......	75.68	76.73	79.48	79.23	77.48	77.58	75.78	75.83	75.53	......	......	......
7......	75.68	76.53	79.58	79.08	77.43	78.33	75.73	75.83	75.58	......	......	......
8......	75.73	76.58	79.58	78.98	77.38	78.43	75.68	75.88	75.63	......	......	......
9......	75.78	76.53	79.18	78.78	77.33	78.18	75.73	75.93	75.58	......	......	......
10......	75.73	76.68	78.98	78.38	77.23	78.03	75.63	75.93	75.68	......	......	......
11......	75.73	76.68	78.73	78.08	77.23	78.03	75.63	75.88	75.78	......	......	......
12......	75.78	76.58	78.58	77.78	77.08	77.93	75.63	75.93	75.68	......	......	......
13......	75.73	76.33	78.23	77.73	76.78	77.98	75.68	75.93	75.58	......	......	......
14......	75.78	76.48	78.08	77.48	76.68	77.78	75.63	75.93	75.53	......	......	......
15......	75.83	76.43	77.98	77.18	76.43	77.58	75.53	75.88	75.58	......	......	......
16......	75.78	76.43	77.73	77.13	76.58	77.38	75.58	75.63	75.63	......	......	......
17......	75.73	76.28	77.53	77.03	76.48	77.23	75.73	75.63	75.68	......	......	......
18......	75.78	76.38	77.33	76.98	76.43	77.08	75.73	75.58	75.83	......	......	......
19......	75.73	76.48	77.18	76.93	76.33	77.03	75.78	75.53	75.78	......	......	......
20......	75.83	76.53	77.03	77.98	76.33	76.98	75.83	75.53	75.63	......	......	......
21......	75.88	76.63	77.28	78.73	76.28	76.83	75.78	75.53	75.53	......	......	......
22......	78.53	76.53	77.63	78.33	76.13	76.68	75.63	75.53	75.58	......	......	......
23......	77.88	76.63	77.98	78.03	76.63	76.53	75.68	75.58	75.63	......	......	......
24......	77.73	76.63	78.88	77.98	76.83	76.43	75.73	75.53	75.68	......	......	......
25......	77.58	76.53	79.48	77.68	*b*	76.33	75.68	75.58	75.68	......	......	......
26......	77.33	76.68	79.63	77.58	77.58	76.28	75.63	75.53	75.63	......	......	......
27......	77.13	76.73	79.73	78.03	78.13	76.18	75.73	75.53	75.63	......	......	......
28......	76.98	78.78	79.73	78.38	*b*	76.13	75.73	75.53	75.53	......	......	......
29......	76.78	......	79.78	78.13	*b*	76.03	75.68	75.53	75.73	......	......	......
30......	76.63	......	79.78	77.98	*b*	75.98	75.73	75.53	76.68	......	......	......
31......	76.63	......	80.28	......	78.03	......	75.73	75.53	......	......	......	......

b No record.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River at Highway Bridge, Stillwater, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.*b*	Nov.*b*	Dec.*b*
1910.												
1......	84.24	84.84	87.09	88.24	85.79	85.89	83.89	83.94	84.09	......	......	......
2......	84.39	84.84	87.34	88.29	85.84	85.94	83.79	83.94	84.09	......	......	......
3......	84.49	84.79	87.39	88.19	85.94	85.89	83.74	83.79	84.19	......	......	......
4......	84.49	84.54	87.49	87.74	85.89	85.64	83.74	83.69	84.29	......	......	......
5......	84.64	84.39	87.39	87.14	85.89	85.44	83.79	83.94	84.24	......	......	......
6......	84.69	84.24	87.09	86.94	75.79	85.64	83.79	84.09	84.14	......	......	......
7......	84.54	84.19	87.24	86.84	85.74	86.04	83.79	84.09	84.04	......	......	......
8......	84.29	84.24	87.24	86.74	85.69	86.44	83.69	84.09	83.99	......	......	......
9......	84.19	84.29	86.94	86.64	85.74	86.34	83.79	84.09	84.09	......	......	......
10......	84.14	83.24	86.74	86.44	85.69	86.29	83.64	84.04	84.14	......	......	......
11......	84.26	84.19	86.54	86.34	85.54	86.14	83.54	84.04	84.19	......	......	......
12......	83.89	84.14	86.34	85.94	85.34	85.99	83.39	84.09	84.19	......	......	......
13......	84.49	84.04	86.19	85.69	85.24	85.89	83.29	84.14	84.14	......	......	......
14......	84.64	84.04	86.14	85.59	84.99	85.79	83.19	84.29	84.09	......	......	......
15......	84.59	84.14	85.94	85.39	84.79	85.64	83.19	84.29	84.09	......	......	......
16......	84.39	84.14	85.74	85.24	84.89	85.49	83.09	84.29	84.14	......	......	......
17......	84.39	*a*	85.64	85.14	84.94	85.44	83.24	84.19	84.19	......	......	......
18......	84.34	*a*	85.44	85.09	84.89	85.39	83.29	84.19	84.19	......	......	......
19......	84.34	*a*	85.39	85.14	84.84	85.29	83.44	84.09	84.14	......	......	......
20......	84.29	84.24	85.44	85.69	84.79	85.34	83.54	84.09	83.99	......	......	......
21......	84.54	84.20	85.64	86.54	84.79	85.14	83.64	84.04	83.99	......	......	......
22......	86.39	84.29	85.79	85.94	84.79	85.04	83.64	84.14	83.99	......	......	......
23......	85.74	84.39	86.14	85.79	84.84	84.79	83.54	84.09	83.99	......	......	......
24......	85.74	84.64	86.39	85.74	84.89	84.74	83.29	84.09	84.09	......	......	......
25......	85.69	84.64	86.79	85.69	*b*	84.59	83.24	84.09	84.19	......	......	......
26......	85.54	84.59	87.09	85.64	85.54	84.49	83.49	84.09	84.14	......	......	......
27......	85.34	84.94	87.44	85.69	85.79	84.39	83.49	84.09	84.09	......	......	......
28......	85.19	86.39	87.49	85.84	*b*	84.29	83.59	84.09	84.09	......	......	......
29......	85.14	......	87.59	85.89	*b*	84.19	83.79	84.19	84.24	......	......	......
30......	84.84	......	87.64	85.89	*b*	84.14	83.79	84.14	84.84	......	......	......
31......	84.84	......	87.94	......	85.89	......	83.89	84.09	......	......	......	......

a Ice obstruction; no record. *b* No record.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River at Schuylerville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	84.90	86.15	91.85	93.50	87.70	87.70	84.40	84.10	84.40	85.20	85.00	84.75
2......	84.90	85.90	92.85	93.50	86.95	87.70	84.40	84.00	84.25	84.85	84.80	84.65
3......	84.40	85.30	93.05	92.90	86.20	87.30	84.15	83.85	84.25	84.85	84.90	84.50
4......	84.75	85.20	93.10	91.70	87.00	86.75	84.10	84.10	84.15	84.85	85.00	84.15
5......	84.85	85.15	92.75	90.45	87.60	86.30	84.05	84.40	84.20	84.70	85.05	84.40
6......	85.10	85.10	91.70	90.25	87.50	87.00	84.15	84.50	84.30	84.70	85.30	84.50
7......	84.95	85.10	91.20	90.25	87.25	88.20	84.10	84.50	84.70	84.30	85.85	84.30
8......	84.85	84.95	91.00	89.90	86.70	88.50	84.10	84.50	84.60	84.50	85.50	84.10
9......	84.30	85.05	90.60	89.70	86.90	88.40	84.10	84.35	84.70	84.50	85.30	84.00
10......	84.45	85.05	90.10	88.70	86.70	88.10	83.95	84.25	84.80	84.40	85.10	83.95
11......	84.45	84.95	89.60	88.30	86.50	88.70	83.70	84.35	84.50	84.50	85.00	83.75
12......	84.05	84.90	89.00	88.05	86.20	87.65	83.60	84.00	84.65	84.40	84.90	83.80
13......	84.35	84.95	88.50	87.70	85.85	87.70	83.50	84.60	84.55	84.40	84.85	83.55
14......	84.50	85.00	88.25	87.10	85.50	87.40	83.50	84.55	84.50	84.50	85.10	83.40
15......	84.60	85.05	87.80	86.40	85.30	87.00	83.50	84.70	84.55	84.50	84.90	84.00
16......	84.65	85.05	87.40	86.30	85.50	86.60	83.50	84.60	84.40	84.40	84.75	84.10
17......	84.45	85.15	87.05	86.25	85.30	86.50	83.60	84.55	84.30	84.40	84.70	84.10
18......	84.40	85.20	86.85	86.00	85.15	86.40	83.75	84.45	84.00	84.55	84.70	83.80
19......	85.80	85.05	86.55	86.70	85.10	86.30	84.00	84.35	84.20	84.50	84.70	84.05
20......	85.40	84.85	86.60	87.60	85.05	86.40	83.75	84.10	84.10	84.35	84.20	84.25
21......	85.05	84.90	86.80	88.80	85.10	85.95	83.65	84.10	84.20	84.45	84.60	84.25
22......	88.50	85.80	87.30	88.00	85.40	85.75	83.80	84.60	84.00	84.40	84.70	84.20
23......	87.70	85.70	87.40	87.75	85.60	85.50	83.85	84.50	84.10	84.40	84.55	84.30
24......	87.45	85.70	87.60	87.90	85.55	85.30	83.50	84.60	84.15	84.55	84.50	84.25
25......	87.25	85.50	88.90	87.30	85.80	85.10	83.50	84.40	84.05	84.70	84.45	84.20
26......	87.10	85.35	91.00	86.90	87.20	84.95	83.80	84.45	84.10	84.75	84.30	85.00
27......	86.55	85.40	91.40	87.70	88.10	85.00	83.75	84.40	84.25	84.70	84.10	84.90
28......	86.45	89.65	91.90	88.40	87.90	84.65	83.80	84.10	84.60	84.90	84.30	84.90
29......	86.30	......	91.40	87.70	87.40	84.60	83.70	84.20	85.60	85.10	84.55	84.95
30......	86.15	......	92.50	87.15	87.20	84.55	83.65	84.30	85.70	84.95	84.70	85.00
31......	86.10	......	92.95	......	87.75	......	83.50	84.25	......	85.20	......	85.05

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River at Free Bridge, near Liberty Mills, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	85.04	86.49	94.04	94.64	88.09	88.74	84.74	84.64	84.39	86.18	85.68	84.78
2......	84.94	85.84	94.34	94.74	87.99	88.74	84.04	84.54	84.54	85.98	85.48	84.68
3......	84.84	85.94	94.39	93.04	87.79	88.39	83.84	84.04	84.59	85.38	85.18	84.53
4......	84.34	85.84	94.34	92.84	88.44	87.79	84.44	83.94	84.29	85.23	85.08	84.58
5......	84.89	85.84	93.84	91.94	88.64	87.64	85.14	84.34	84.34	85.13	85.08	84.68
6......	85.44	85.74	92.74	91.34	88.64	88.04	84.84	84.69	85.24	85.08	85.38	85.08
7......	85.54	86.04	92.34	91.54	88.49	89.34	84.74	84.74	85.34	85.03	85.98	84.78
8......	85.54	85.84	91.99	90.94	88.34	89.74	84.84	84.69	85.24	84.93	86.08	84.58
9......	85.54	85.64	91.49	90.14	88.19	89.74	84.64	84.64	85.24	84.28	85.88	84.38
10......	85.54	85.44	90.64	89.74	88.14	89.19	83.99	84.54	85.14	84.68	85.38	84.38
11......	84.74	85.64	90.14	89.04	87.54	88.84	83.99	84.64	85.14	85.03	85.28	84.28
12......	84.79	85.84	89.69	88.84	87.09	88.74	83.74	84.34	85.14	84.83	85.13	83.93
13......	85.24	85.89	89.54	88.64	86.84	88.79	83.84	84.44	85.04	84.78	84.88	83.73
14......	85.34	85.94	89.34	88.19	86.34	88.54	84.04	84.54	85.04	84.88	85.28	84.08
15......	85.54	85.64	88.94	87.89	85.89	87.89	84.24	84.84	84.94	84.88	84.98	84.38
16......	85.14	85.84	88.44	87.64	86.24	87.51	84.14	84.89	84.68	84.63	84.78	84.72
17......	85.14	85.99	88.09	87.19	86.24	87.44	84.14	84.79	84.33	85.13	84.83	84.67
18......	85.24	85.99	87.59	86.89	85.89	87.44	84.94	84.84	84.18	84.78	84.93	84.42
19......	86.94	85.94	87.21	88.44	85.74	87.24	84.69	84.59	84.48	84.73	84.98	84.62
20......	86.14	85.84	87.04	89.09	85.94	87.24	84.19	84.54	84.28	84.78	84.88	84.72
21......	85.49	85.84	87.34	89.59	85.79	86.94	84.01	84.19	84.38	84.58	84.18	84.72
22......	90.54	86.64	87.99	89.34	85.74	86.74	84.54	84.69	84.18	84.73	85.18	84.72
23......	89.84	86.64	88.29	88.94	86.34	86.34	84.39	85.04	84.23	84.53	84.98	84.72
24......	89.84	86.24	88.69	89.04	86.54	85.89	84.04	84.99	84.68	84.88	84.78	84.77
25......	89.29	86.24	89.94	88.59	86.64	85.29	84.34	84.84	84.73	85.13	84.68	84.62
26......	88.99	86.34	91.89	88.29	88.34	84.74	84.64	84.84	84.68	85.18	85.18	85.42
27......	88.04	86.69	92.59	88.84	89.29	85.24	84.59	84.69	83.98	85.05	85.08	85.62
28......	87.79	91.29	92.64	89.34	89.14	84.94	84.44	84.29	84.88	84.98	85.08	85.22
29......	87.44	......	92.64	89.14	88.64	85.49	83.89	84.29	86.38	84.98	85.08	85.22
30......	87.34	......	93.19	88.29	88.49	85.14	83.94	84.79	86.58	84.58	84.93	85.47
31......	87.34	......	94.09	......	88.74	......	84.24	84.64	......	85.33	......	85.62

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River above Dam at Northumberland, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct,	Nov.	Dec.
1910.												
1......	102.43	103.93	106.28	107.63	105.68	105.63	102.73	103.38	102.23	104.38	103.98	103.88
2......	102.63	103.63	106.73	107.58	105.43	105.63	102.83	102.73	102.53	104.68	103.48	102.63
3......	102.68	103.08	106.83	107.33	105.33	105.58	103.53	102.43	102.58	103.83	103.58	103.13
4......	102.33	102.48	106.68	106.73	105.63	105.13	104.13	102.63	104.13	102.48	103.83	103.88
5......	102.28	102.73	106.28	106.23	105.58	105.23	103.98	103.03	103.38	102.58	104.08	102.98
6......	102.18	103.48	106.13	106.03	105.33	105.38	103.53	103.43	103.73	102.73	104.58	103.53
7......	102.13	103.03	106.13	105.73	105.78	105.93	103.33	104.23	103.68	102.33	104.28	103.43
8......	102.33	102.48	106.13	105.78	105.23	106.18	103.73	103.48	102.93	102.43	104.23	102.58
9......	102.18	102.33	105.88	105.93	105.33	106.23	103.33	102.58	103.63	103.98	103.93	102.33
10......	102.93	102.23	105.78	105.53	105.03	105.73	103.48	102.63	103.48	103.33	103.83	101.53
11......	101.03	102.03	105.58	104.83	104.88	105.83	103.13	102.63	104.18	102.73	103.88	102.23
12......	101.38	101.98	105.23	104.78	104.33	105.93	102.63	103.83	103.78	103.43	103.38	100.73
13......	101.03	102.68	104.83	104.63	104.28	105.53	102.48	103.73	103.03	102.93	104.13	100.78
14......	101.13	102.53	104.03	104.33	104.73	105.13	102.38	104.53	102.93	102.78	103.58	102.18
15......	101.13	102.43	104.23	104.43	......	105.08	102.33	103.58	103.03	102.93	102.78	101.68
16......	101.03	101.93	104.08	104.13	104.28	104.98	102.43	102.73	102.53	104.08	103.43	101.23
17......	100.93	102.03	103.93	104.13	104.03	104.93	103.63	102.43	102.43	103.08	103.13	101.18
18......	100.83	102.03	103.78	103.93	103.83	104.93	103.38	102.63	103.68	102.73	103.48	102.28
19......	101.03	101.83	103.83	105.48	103.93	105.03	102.83	102.68	102.58	102.78	103.53	103.03
20......	100.78	103.43	104.68	106.08	103.88	104.98	102.53	102.73	102.23	102.58	104.18	102.43
21......	101.08	101.48	104.08	106.48	104.23	104.63	102.73	104.18	102.33	102.43	103.13	101.58
22......	104.43	101.83	103.83	105.88	104.78	104.58	102.63	102.83	102.43	102.63	103.43	102.28
23......	104.93	102.13	104.13	105.53	104.53	104.33	102.53	102.33	102.53	103.68	103.23	101.93
24......	104.93	102.48	104.93	105.73	104.53	103.93	103.78	102.38	102.23	103.13	103.38	102.48
25......	105.08	102.68	105.48	105.53	104.73	103.83	103.28	102.33	104.08	103.53	102.43	104.38
26......	104.73	102.93	106.18	105.43	105.28	104.28	102.78	102.53	103.43	103.33	103.73	104.63
27......	104.63	103.58	106.93	105.88	105.78	103.38	102.53	102.98	102.43	103.68	104.13	103.43
28......	104.38	104.38	106.58	106.13	105.98	102.98	102.43	104.08	103.03	103.43	103.33	102.78
29......	104.13	......	106.68	105.73	105.93	103.13	102.33	102.98	104.63	103.53	103.68	103.63
30......	104.23	......	107.03	105.33	105.53	102.83	102.68	102.28	104.63	104.43	102.48	103.23
31......	103.93	......	107.43	......	105.73	......	104.03	102.43	......	103.98	......	103.63

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River at Hill St., Fort Miller, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	101.87	103.52	106.22	108.97	106.12	105.92	102.92	103.47	102.27	104.32	104.02	103.52
2......	102.42	103.22	107.32	108.87	105.42	105.92	102.92	102.57	102.42	104.57	103.77	103.37
3......	102.22	103.22	107.37	108.57	105.47	105.67	104.02	102.47	102.62	104.07	103.47	102.82
4......	101.27	103.27	107.62	107.67	105.47	105.17	104.12	102.77	104.32	102.87	103.62	104.32
5......	102.32	103.47	107.42	106.92	105.87	105.37	103.97	102.82	103.57	102.82	103.82	102.32
6......	102.27	104.17	107.12	106.62	105.77	105.37	103.37	103.37	103.82	102.92	104.82	103.57
7......	101.82	103.57	106.92	106.47	105.52	106.17	103.07	104.42	103.37	102.27	104.62	103.42
8......	101.62	102.92	106.97	106.22	105.67	106.42	103.52	103.37	102.92	102.32	104.32	102.42
9......	102.12	102.57	106.67	106.37	105.37	106.27	103.42	102.67	103.92	104.27	104.17	102.32
10......	102.52	102.82	106.12	105.77	105.32	106.12	103.77	102.62	103.42	103.52	103.77	101.57
11......	101.12	102.12	105.77	105.12	104.97	105.87	102.77	102.72	104.32	103.17	103.77	101.97
12......	102.07	102.92	105.52	104.77	104.87	106.12	102.37	102.52	103.37	103.42	103.47	101.57
13......	101.72	103.37	105.22	104.72	104.57	105.87	102.37	103.67	102.62	103.02	104.47	100.82
14......	101.72	103.17	105.07	104.52	104.37	105.57	102.47	104.57	102.82	103.02	104.07	101.67
15......	101.92	102.92	104.67	104.32	104.77	105.37	102.47	103.47	102.77	102.97	103.17	101.62
16......	101.12	102.67	104.42	104.17	104.37	105.02	102.37	102.77	102.72	104.37	103.32	101.77
17......	102.02	103.12	104.22	104.77	104.17	104.92	103.77	102.37	102.47	103.12	103.27	101.87
18......	101.72	103.17	103.97	104.27	103.87	104.92	103.32	102.47	103.57	102.37	103.42	101.87
19......	101.82	102.82	104.07	105.47	103.97	105.32	102.77	102.77	102.87	102.62	103.37	102.87
20......	100.97	103.27	104.82	105.87	103.97	104.97	102.52	102.52	102.62	102.52	103.87	102.07
21......	101.22	102.32	104.22	106.67	104.07	104.67	102.82	104.12	102.27	102.62	102.97	102.17
22......	104.17	102.87	104.42	106.12	104.77	104.57	102.87	103.22	102.42	102.87	103.27	102.22
23......	104.72	103.02	104.67	105.67	104.52	104.37	102.52	102.57	102.72	104.22	102.87	102.12
24......	105.12	103.07	104.92	106.27	104.47	103.92	103.77	102.32	102.22	103.12	102.92	102.07
25......	105.02	103.22	105.57	105.37	104.52	103.82	103.27	102.22	103.67	103.67	102.27	103.92
26......	104.87	103.42	107.37	105.37	105.67	104.27	102.52	102.22	102.87	103.22	103.77	104.52
27......	104.67	103.42	107.67	105.77	106.17	103.32	102.37	102.47	102.32	103.22	104.17	103.27
28......	104.42	104.47	107.47	106.27	106.07	102.72	102.37	103.82	102.92	103.17	103.47	102.22
29......	104.27	......	107.47	106.02	106.07	102.92	102.57	102.87	102.67	103.72	103.47	102.97
30......	104.37	......	107.97	105.47	105.62	102.92	102.72	102.42	103.57	104.67	102.37	102.67
31......	103.92	......	108.57	......	105.82	......	103.97	102.67	......	104.27	......	103.17

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River below Dam at Fort Miller, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	104.83	105.33	107.63	109.28	106.48	106.33	104.93	104.93	104.88	105.13	105.08	105.03
2......	104.83	105.18	108.63	109.18	105.88	106.33	104.88	104.88	104.88	104.98	104.98	104.93
3......	104.88	105.18	108.98	108.88	105.98	106.03	104.98	104.88	104.88	105.03	104.98	104.98
4......	104.78	105.28	109.03	108.08	105.88	105.68	104.98	104.83	104.98	104.93	105.03	104.88
5......	104.93	105.18	108.83	107.48	106.18	105.63	104.93	104.88	104.88	104.88	105.08	104.98
6......	104.98	105.08	107.88	107.08	106.23	105.88	104.88	104.88	104.98	104.98	104.98	104.98
7......	104.88	104.98	107.78	106.93	105.98	106.58	104.93	104.78	104.93	104.98	105.08	105.03
8......	104.83	105.03	107.83	106.83	105.83	106.78	104.98	104.78	104.88	104.88	105.13	104.98
9......	104.88	105.03	107.43	106.93	105.93	106.68	104.98	104.78	104.98	104.88	105.08	104.98
10......	104.83	104.98	106.98	106.33	105.93	106.53	104.98	104.78	104.93	104.88	104.98	104.88
11......	104.78	104.93	106.58	105.98	105.83	106.28	104.88	104.78	104.98	104.93	104.98	104.88
12......	104.83	105.03	106.23	105.78	105.73	106.18	104.88	104.78	104.98	104.93	104.98	104.78
13......	104.88	105.13	106.28	105.83	105.63	106.28	104.78	104.83	104.98	104.93	104.98	104.68
14......	104.83	105.03	106.08	105.73	105.43	105.98	104.83	104.88	104.98	104.93	104.98	104.98
15......	104.98	104.93	105.98	105.43	105.18	105.78	104.83	104.88	104.98	104.93	104.98	104.98
16......	104.78	104.93	105.83	105.33	105.23	105.63	104.88	104.88	104.98	104.98	104.98	104.98
17......	104.83	104.93	105.63	105.43	105.08	105.48	104.78	104.88	104.98	104.98	104.98	104.98
18......	104.88	104.98	105.48	105.23	105.08	105.58	104.98	104.88	104.98	104.98	104.98	104.88
19......	104.98	105.03	105.38	106.03	105.08	105.48	105.03	104.88	104.98	104.93	104.98	104.98
20......	104.78	105.13	105.43	106.33	105.03	105.58	105.03	104.88	104.98	104.93	104.98	104.98
21......	104.83	104.93	105.48	107.03	104.98	105.43	104.98	104.88	104.98	104.93	104.93	104.98
22......	105.13	105.03	105.58	106.58	105.13	105.23	104.93	104.88	104.98	104.93	104.98	104.98
23......	106.48	105.08	105.73	106.23	105.28	105.08	104.78	104.88	104.98	104.93	104.98	104.98
24......	106.58	105.08	105.93	106.23	105.28	104.98	104.88	104.88	104.98	104.98	104.98	104.98
25......	106.43	104.98	106.38	105.78	105.38	105.03	104.78	104.88	104.98	104.98	104.93	104.98
26......	106.28	105.08	107.63	105.83	106.08	104.98	104.83	104.88	104.98	104.98	105.03	104.98
27......	106.03	105.03	107.93	106.23	106.48	104.93	104.78	104.88	104.98	104.98	104.98	104.98
28......	105.73	105.68	107.78	106.73	106.48	104.93	104.78	104.88	104.98	104.98	104.98	104.98
29......	105.58	......	107.78	106.38	106.33	104.98	104.88	104.88	105.33	105.03	105.03	104.98
30......	105.48	......	108.18	105.98	106.13	104.98	104.88	104.88	105.28	104.98	104.98	104.98
31......	105.58	......	108.83	......	106.28	......	104.83	104.88	......	105.08	......	104.98

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River above Dam at Fort Miller, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	114.90	116.00	117.35	119.25	117.20	117.20	115.40	115.15	115.40	116.00	115.85	115.50
2......	114.82	115.85	117.90	119.15	116.75	117.10	115.10	114.90	115.05	116.10	115.65	115.10
3......	114.50	115.80	118.10	119.00	116.80	116.80	115.70	115.00	114.95	115.75	115.65	115.30
4......	114.40	115.85	118.25	118.55	116.80	116.65	115.70	115.35	115.80	115.15	115.75	115.75
5......	115.40	115.60	118.20	118.15	117.05	116.90	115.25	115.65	114.85	115.15	115.85	115.05
6......	115.20	115.90	118.10	118.00	117.05	116.70	114.85	115.95	115.45	115.40	116.05	115.45
7......	114.90	115.55	117.95	118.05	116.75	117.30	114.90	116.00	115.45	115.05	116.10	115.40
8......	114.55	115.30	118.00	117.85	116.90	117.45	114.95	115.70	115.25	115.10	116.15	115.25
9......	114.60	115.30	117.90	117.80	116.65	117.40	114.90	115.45	115.65	115.70	116.05	115.20
10......	114.80	115.15	117.70	117.45	116.70	117.30	115.20	115.20	115.35	115.30	115.80	115.05
11......	114.40	115.15	117.45	116.90	116.60	117.15	114.40	115.35	116.00	115.55	115.95	115.45
12......	114.70	115.35	117.05	116.90	116.45	117.30	114.60	114.80	115.40	115.30	115.60	114.70
13......	114.90	116.05	117.00	116.90	116.35	117.25	114.65	115.90	114.80	115.30	116.00	114.75
14......	114.80	115.70	116.85	116.80	116.35	116.90	114.80	115.95	115.15	115.30	115.65	115.20
15......	115.15	115.40	116.95	116.45	116.40	116.70	114.55	115.70	115.25	115.30	115.50	114.95
16......	114.55	115.30	116.80	116.30	116.15	116.50	114.55	115.65	115.30	115.70	115.55	115.15
17......	114.60	115.35	116.65	116.70	115.90	116.45	115.10	115.05	115.05	115.15	115.45	115.00
18......	114.55	115.45	116.50	116.15	115.80	116.45	114.85	115.25	115.60	115.35	115.50	115.40
19......	115.60	115.35	116.30	116.85	115.85	116.70	114.85	115.50	114.65	115.15	115.55	115.00
20......	114.60	116.05	116.70	117.05	115.85	116.40	114.75	115.15	114.70	115.20	115.80	115.10
21......	114.70	115.30	116.55	117.60	115.80	116.25	114.85	115.85	114.95	115.25	114.95	115.00
22......	115.75	115.25	116.65	117.30	116.35	116.10	114.90	115.10	114.90	115.25	115.40	115.05
23......	116.70	115.55	116.80	116.95	116.15	116.05	114.55	115.00	115.20	115.55	115.30	115.10
24......	116.75	115.60	117.00	117.10	116.20	115.80	115.25	114.65	114.95	115.00	115.45	115.00
25.....	116.75	116.20	117.55	116.65	116.25	115.90	114.70	114.60	115.55	115.55	114.95	115.90
26......	116.65	116.15	118.30	116.75	116.95	116.25	114.90	114.85	114.75	115.45	115.55	115.45
27......	116.60	116.20	118.60	117.05	117.35	115.50	114.80	115.05	115.10	115.50	115.75	115.10
28......	116.40	116.20	118.45	117.45	117.30	115.40	114.75	115.25	115.40	115.40	115.15	114.95
29......	116.25	...	118.40	117.20	117.40	115.40	114.85	114.65	116.35	115.80	115.50	115.10
30......	116.50	......	118.75	116.85	116.95	115.30	114.90	114.60	116.20	116.15	115.10	115.15
31.....	116.20	......	119.00	......	117.15	......	115.10	114.90	......	115.95	......	115.45

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River above Crocker's Reef Dam.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	119.71	120.11	121.66	124.06	121.51	121.56	120.41	119.66	119.51	120.36	120.11	119.91
2	119.36	120.06	122.46	123.96	121.21	121.51	119.81	119.61	119.51	120.06	120.06	119.71
3	119.56	119.96	122.76	123.71	121.26	121.31	119.76	119.66	119.66	120.06	120.06	119.86
4	119.31	119.96	122.91	123.16	121.21	121.01	119.71	119.71	119.86	119.71	120.11	119.56
5	119.66	120.01	122.76	122.41	121.56	120.86	119.56	119.81	119.61	119.81	120.16	119.46
6	119.81	119.96	122.46	122.51	121.46	121.16	119.56	119.91	119.76	119.81	120.26	119.91
7	119.71	119.91	122.36	122.36	121.31	121.76	119.56	119.91	119.91	119.56	120.41	119.86
8	119.56	119.91	122.41	122.26	121.11	121.86	119.61	119.81	119.91	119.76	120.36	119.71
9	119.36	119.96	122.26	122.31	121.16	121.81	119.61	119.61	120.01	119.81	120.31	119.71
10	119.66	119.91	122.01	121.76	121.16	121.66	119.46	119.71	119.96	119.81	120.16	119.56
11	119.46	119.81	121.81	121.56	120.96	121.56	119.36	119.76	119.86	119.91	120.06	119.41
12	119.56	119.86	121.71	121.31	120.81	121.46	119.31	119.76	119.91	119.76	120.11	119.36
13	119.66	119.76	121.56	121.36	120.66	121.41	119.26	119.96	119.66	119.91	120.01	119.31
14	119.66	120.01	121.46	121.21	120.46	121.31	119.31	120.01	119.66	119.81	120.06	119.56
15	119.71	119.76	121.31	120.91	120.46	121.16	119.41	119.81	119.86	119.76	119.96	119.66
16	119.36	119.81	121.16	120.86	120.46	120.96	119.36	119.81	119.91	119.86	119.81	119.71
17	119.56	119.86	121.06	120.76	120.36	120.86	119.41	119.61	119.86	119.81	119.96	119.66
18	119.66	119.86	120.86	120.51	120.26	120.86	119.61	119.71	119.66	119.81	119.91	119.56
19	119.86	119.86	120.76	121.26	121.26	120.86	119.56	119.81	119.51	119.76	119.91	119.71
20	119.41	119.81	120.76	121.66	120.26	120.81	119.56	119.71	119.66	119.71	119.71	119.71
21	119.46	119.81	120.81	122.11	120.31	120.66	119.51	119.61	119.76	119.66	119.66	119.66
22	119.41	119.91	121.01	121.66	120.41	120.56	119.66	119.56	119.66	119.86	119.86	119.66
23	119.36	119.96	121.26	121.46	120.51	120.41	119.56	119.56	119.66	119.66	119.81	119.71
24	120.91	119.91	121.51	121.51	120.56	120.06	119.46	119.61	119.66	119.61	119.81	119.71
25	120.91	119.91	121.96	121.26	120.66	120.01	119.51	119.51	119.46	119.96	119.56	119.46
26	120.86	119.91	122.91	121.21	121.41	119.91	119.51	119.51	119.46	119.81	119.91	119.91
27	120.66	119.96	123.01	121.51	121.71	119.86	119.51	119.76	119.71	119.86	119.56	119.76
28	120.61	120.46	122.96	121.81	121.66	119.86	119.51	119.56	120.21	119.86	119.61	119.66
29	120.46	......	123.06	121.61	121.46	119.86	119.41	119.46	120.61	119.86	119.91	119.71
30	120.31	......	123.31	121.21	121.41	119.86	119.51	119.46	120.51	120.16	119.76	119.76
31	120.31	......	123.76	......	121.51	......	119.51	119.46	......	120.16	......	119.81

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River at Moses Kill.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	119.80	120.40	122.50	125.30	121.75	121.90	119.90	119.45	119.45	120.60	120.10	120.00
2	119.35	119.95	124.65	125.20	121.35	121.85	119.80	119.55	119.45	120.00	120.05	119.90
3	119.55	120.00	124.15	124.90	121.55	121.55	119.50	119.65	119.50	119.95	120.15	119.95
4	119.35	119.90	124.45	124.15	121.50	121.25	119.65	119.75	119.80	119.70	120.15	119.65
5	119.70	120.00	124.15	123.50	121.90	121.05	119.55	119.80	119.55	119.70	120.10	119.65
6	119.85	120.00	123.70	123.25	121.75	121.45	119.80	119.95	119.80	119.80	120.15	120.00
7	119.80	119.90	123.30	123.15	121.50	122.10	119.75	120.00	119.95	119.50	120.45	119.80
8	119.70	119.75	123.15	122.95	121.50	122.30	119.70	119.90	119.95	119.65	120.35	119.65
9	119.35	120.00	123.05	123.00	121.25	122.25	119.60	119.60	119.95	119.75	120.30	119.65
10	119.70	119.90	122.90	122.25	121.35	122.05	119.35	119.60	119.85	119.75	120.15	119.55
11	119.40	119.85	122.30	121.95	121.10	121.75	119.35	119.60	119.45	119.85	120.05	119.45
12	119.65	119.70	122.10	121.40	120.95	121.55	119.40	119.50	119.85	119.75	120.10	119.40
13	119.65	119.80	122.00	121.65	120.75	121.65	119.45	120.05	119.75	119.85	119.80	119.25
14	119.65	120.00	121.95	121.40	120.50	121.55	119.40	119.65	119.70	119.75	120.05	119.55
15	119.95	120.00	121.70	121.10	120.30	121.35	119.40	119.85	119.85	119.75	120.00	119.60
16	119.45	119.90	121.45	121.05	120.60	121.05	119.40	119.65	119.90	119.60	119.95	119.65
17	119.55	119.90	121.25	120.95	120.40	121.10	119.40	119.55	119.60	119.70	119.80	119.70
18	119.65	119.80	121.00	120.60	120.30	120.95	119.50	119.65	119.40	119.65	119.90	119.40
19	119.70	119.65	120.90	121.45	120.30	120.95	119.40	119.75	119.55	119.75	120.05	119.60
20	119.30	119.65	120.95	121.95	120.25	121.00	119.45	119.60	119.75	119.60	119.70	119.65
21	119.30	119.90	121.05	122.65	120.30	120.75	119.45	119.40	119.60	119.60	119.65	119.60
22	120.45	119.90	121.25	122.05	120.45	120.60	119.55	119.50	119.65	119.50	119.80	119.60
23	120.50	120.10	121.50	121.80	120.55	120.50	119.55	119.60	119.70	119.55	119.75	119.60
24	121.15	120.00	121.80	121.95	120.55	120.35	119.25	119.55	119.65	119.50	119.70	119.65
25	121.20	120.00	122.45	121.40	120.70	120.05	119.55	119.55	119.45	119.95	119.65	119.45
26	121.00	119.90	123.80	121.45	121.70	120.20	119.55	119.45	119.40	119.80	119.85	119.85
27	120.90	119.90	123.95	121.80	122.15	119.95	119.50	119.40	119.70	119.85	119.50	119.70
28	120.80	120.60	123.95	122.25	122.05	119.95	119.50	119.35	119.90	119.55	119.55	119.65
29	120.65	......	124.00	121.95	121.70	119.85	119.55	119.35	120.65	119.85	119.95	119.75
30	120.50	......	124.35	121.70	121.60	119.75	119.50	119.55	120.55	120.15	119.70	119.75
31	120.50	......	124.95	......	121.85	......	119.50	119.60	......	120.10	......	119.85

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River opposite Snook Kill near Fort Edward, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	119.95	120.65	123.10	126.60	122.25	122.35	120.10	119.95	119.75	120.50	120.25	120.00
2......	119.65	120.55	124.65	126.50	121.80	122.35	120.05	119.75	119.75	120.05	120.20	119.85
3......	119.70	120.45	125.45	126.10	122.00	121.95	119.70	119.80	119.80	120.20	120.20	119.95
4......	119.65	120.45	125.80	125.15	121.85	121.60	119.80	119.95	120.05	119.90	120.25	119.65
5......	120.00	120.40	125.25	124.30	122.30	121.25	119.95	120.10	119.85	119.85	120.30	119.60
6......	120.20	120.20	124.45	124.05	122.25	121.90	120.30	120.30	120.10	119.90	120.15	119.95
7......	120.00	120.25	124.25	123.85	121.95	122.65	119.90	119.90	120.05	119.70	120.70	119.90
8......	119.80	120.20	124.50	123.60	121.75	122.85	119.85	120.05	120.25	119.85	120.60	119.80
9......	119.60	120.20	124.00	123.75	121.85	122.85	119.90	119.90	120.25	119.70	120.45	119.75
10......	119.85	120.25	123.40	122.75	121.75	122.50	119.55	119.95	120.20	119.95	120.30	119.65
11......	119.60	120.30	123.05	122.50	121.40	122.30	119.65	120.00	119.85	119.90	120.15	119.50
12......	119.95	120.40	122.75	122.10	121.30	122.20	119.65	119.75	120.15	119.90	120.20	119.50
13......	119.95	120.15	122.45	122.05	121.00	122.35	119.70	120.35	119.95	119.90	119.90	119.40
14......	119.95	120.45	122.35	121.75	120.70	122.00	119.70	120.05	119.95	119.85	120.25	119.75
15......	120.05	120.30	122.05	121.35	120.60	121.70	119.70	120.05	120.05	119.90	120.05	119.80
16......	119.70	120.30	121.75	121.00	120.75	121.45	119.70	120.00	120.05	119.80	119.90	119.85
17......	119.80	120.25	121.55	121.20	120.60	121.35	119.55	119.75	119.90	119.95	119.95	119.75
18......	119.90	120.80	121.35	120.90	120.50	121.35	119.90	119.95	119.70	119.95	119.95	119.65
19......	120.20	120.55	121.20	122.05	120.50	121.25	119.80	120.00	119.70	119.85	120.00	119.80
20......	119.70	120.25	121.25	122.40	120.50	121.35	119.75	119.95	119.85	119.80	119.70	119.75
21......	119.65	120.20	121.35	123.25	120.50	121.05	119.70	119.80	119.75	119.80	119.70	119.75
22......	120.70	120.30	121.60	122.65	120.65	120.95	119.95	119.90	119.65	119.95	119.95	119.85
23......	121.00	120.45	121.90	122.15	120.85	120.85	119.70	119.95	119.80	119.65	119.85	119.80
24......	121.70	120.50	122.25	122.45	120.85	120.45	119.60	119.80	119.75	119.75	119.90	119.80
25......	121.75	120.50	123.15	121.90	121.05	120.40	119.70	119.75	119.55	120.05	119.65	119.75
26......	121.65	120.55	124.75	121.90	122.30	120.10	119.85	119.75	119.65	119.90	120.00	119.95
27......	121.50	120.50	124.90	122.25	122.65	120.20	119.75	119.95	119.75	120.05	119.55	119.90
28......	121.25	121.10	124.95	122.85	122.60	120.05	119.70	119.55	120.00	119.95	119.75	119.85
29......	121.10	......	124.90	121.50	122.25	120.20	119.80	119.60	120.90	120.05	120.00	119.90
30......	120.90	......	125.40	121.90	122.20	120.10	119.75	119.85	120.75	120.25	119.80	119.90
31......	120.85	......	126.15	......	122.25	......	119.70	119.80	......	120.35	......	120.05

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River at Bridge St., Fort Edward, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	120.04	120.34	123.59	128.24	122.34	122.64	119.64	119.74	119.84	120.54	119.84	119.94
2......	119.84	120.34	125.79	127.99	122.34	122.74	119.64	119.84	119.84	120.14	119.84	120.04
3......	119.34	120.34	126.74	127.49	122.34	122.34	119.64	119.84	119.84	119.84	119.84	120.04
4......	119.34	120.44	126.69	126.34	122.29	121.84	119.64	119.94	120.04	119.84	119.84	119.84
5......	119.34	120.44	126.64	125.24	122.94	121.84	119.84	120.04	119.84	119.84	119.84	119.84
6......	119.84	120.34	125.74	124.99	122.64	122.09	119.84	119.84	119.84	119.84	119.84	119.84
7......	119.84	119.84	125.39	124.54	122.34	122.84	119.84	119.54	119.84	119.84	119.64	119.84
8......	119.84	120.34	125.49	124.39	122.24	123.44	119.64	119.84	119.64	119.84	119.64	119.84
9......	119.84	120.19	124.99	124.34	122.14	123.34	119.64	119.84	119.64	119.74	119.64	119.84
10......	119.94	119.84	123.94	123.34	121.84	122.84	119.39	119.84	119.84	119.84	119.84	119.84
11.....	119.94	119.84	123.34	122.84	121.84	122.84	119.74	119.84	119.84	119.84	119.84	119.84
12......	119.84	119.84	123.04	122.74	121.19	122.84	119.84	119.84	119.84	119.84	119.64	119.64
13......	119.64	119.74	122.94	122.49	120.84	122.84	119.64	119.84	119.84	119.84	119.84	119.64
14....	119.84	120.74	122.64	121.84	120.84	122.84	119.64	119.54	119.84	119.84	120.04	119.64
15......	119.84	120.34	122.69	121.84	120.84	121.94	119.64	119.64	119.64	119.84	120.04	119.64
16......	119.84	120.04	121.84	121.79	120.84	121.84	119.44	119.64	119.64	119.84	120.04	119.74
17......	119.84	120.34	121.49	121.49	120.44	121.54	119.44	119.74	119.64	119.84	119.94	119.64
18......	119.84	120.34	121.24	120.84	120.24	121.34	119.49	119.84	119.64	119.84	119.84	119.64
19......	119.84	119.84	121.24	121.34	119.84	121.54	119.84	119.84	119.84	119.84	119.84	119.64
20......	119.84	120.34	121.84	123.69	119.84	120.84	119.84	119.74	119.84	119.84	120.04	119.64
21......	119.84	120.04	121.74	123.84	120.24	120.64	119.44	119.49	119.84	119.84	120.04	119.64
22......	120.59	119.84	122.04	123.69	120.64	120.44	119.34	119.84	119.84	119.84	120.04	119.64
23......	120.64	120.39	122.44	122.34	120.74	120.44	119.34	119.84	119.84	119.74	120.04	119.84
24......	121.94	120.44	122.74	122.19	120.84	120.04	119.34	119.64	119.84	119.84	120.04	119.84
25......	122.04	120.44	123.69	123.09	121.34	119.94	119.34	119.84	120.04	119.84	120.04	119.84
26......	121.94	120.44	125.84	122.14	122.84	119.84	119.34	119.84	120.34	119.84	120.04	119.84
27......	121.79	120.64	126.14	122.74	123.14	119.84	119.34	119.64	120.34	119.84	119.84	119.84
28......	121.94	121.09	126.14	123.54	123.14	119.64	119.64	119.64	121.04	120.14	119.84	119.84
29......	121.59	......	126.04	122.94	122.84	119.64	119.44	119.64	121.04	120.04	119.84	120.04
30......	120.74	......	126.64	122.49	122.84	119.64	119.44	119.84	120.84	119.84	120.04	120.04
31......	120.84	......	127.59	......	123.44	......	119.64	119.84	......	119.84	.....	120.19

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Hudson River above Feeder Dam, Glens Falls, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	281.12	282.12	283.62	286.52	283.52	283.57	281.67	282.27	281.92	282.77	282 87	281.62
2......	280.97	282.07	284.57	286.42	283.22	283.47	281.57	281.82	281.87	282.62	282.82	281.57
3......	281.22	282.07	284.97	286.07	283.32	283.32	281.37	282.22	281.52	282.37	282.82	281.82
4......	281.32	281.97	285.07	285.57	283.57	283.07	281.42	282.12	282.22	282.12	282.72	281.07
5......	281.42	281.97	284.92	284.97	283.62	282.87	281.42	282.62	282.52	282.02	282.92	281.32
6......	281.42	281.77	284.67	284.77	283.52	283.22	281.42	282.67	282.57	281.82	283.17	281.62
7......	281.27	281.92	284.62	284.72	283.32	283.77	281.37	282.72	282.57	281.62	283.22	281.47
8......	281.17	281.67	284.67	284.56	283.32	284.02	281.42	282.67	282.72	282.37	283.12	281.47
9......	280.97	281.67	284.47	284.17	283.32	283.97	281.42	282.42	282.87	282.32	282.92	281.27
10......	281.07	281.62	284.32	283.97	283.27	283.72	280.82	282.32	282.72	282.72	282.82	281.47
11......	281.22	281.72	284.07	283.57	282.97	283.67	281.12	281.77	282.67	282.57	282.77	280.97
12......	281.32	281.72	283.92	283.57	282.77	283.62	281.07	283.07	282.62	282.67	282.72	280.67
13......	281.32	281.62	283.72	283.57	282.52	283.52	281.07	282.97	282.42	282.52	282.72	281.52
14......	281.32	281.97	283.62	283.12	282.42	283.37	281.12	282.72	282.47	282.42	282.67	281.27
15......	281.27	281.82	283.42	282.87	282.37	283.12	281.42	282.57	282.47	282.67	282.57	281.27
16......	280.97	281.77	283.37	282.67	282.32	282.92	282.07	282.42	282.17	282.32	282.37	281.42
17......	281.32	281.77	283.12	282.82	282.22	282.87	282.07	282.42	281.87	282.42	282.37	281.27
18......	281.32	281.77	282.87	282.52	282.22	282.87	282.22	282.37	281.67	282.17	282.32	281.37
19......	281.12	281.72	282.77	283.62	282.12	282.97	281.82	282.42	282.17	282.27	281.22	281.32
20......	280.77	281.52	282.82	283.87	282.22	282.77	281.92	282.37	282.02	282.32	281.52	281.47
21......	281.12	281.82	282.87	284.12	282.22	282.67	282.12	282.22	281.97	282.27	282.02	281.52
22......	281.72	281.82	283.07	283.77	282.32	282.52	281.92	282.52	282.07	282.42	281.97	281.32
23......	282.47	281.92	283.42	283.42	282.42	282.32	281.77	282.27	282.07	281.92	281.72	281.32
24......	282.92	281.92	283.67	283.62	282.42	282.07	281.57	281.67	282.17	282.62	281.22	281.42
25......	282.97	281.97	284.27	283.17	282.67	281.97	282.02	281.67	281.67	282.47	281.77	281.57
26......	282.92	281.92	285.37	283.32	283.57	281.87	282.02	282.27	281.92	282.42	281.67	281.57
27......	282.72	282.02	285.47	283.62	283.87	281.87	281.67	281.62	282.27	282.47	281.52	281.62
28......	282.67	282.42	285.42	283.87	283.77	281.77	281.72	281.27	282.87	282.42	281.82	281.72
29......	282.52	......	285.47	283.72	283.57	281.72	281.67	282.22	283.42	282.92	281.72	281.57
30......	282.32	......	285.82	283.42	283.32	281.72	281.92	281.87	283.12	283.02	281.87	281.57
31......	282.27	......	286.27	......	283.42	......	282.32	281.82	......	282.92	......	281.42

RECORDS OF DISCHARGE, UPPER HUDSON RIVER AND TRIBUTARIES.

In the following pages will be found tables giving the daily discharge and monthly run-off of the upper Hudson river and its tributaries at a considerable number of locations. These records are derived from various sources. Several important records, including two records of Hudson river at Mechanicville, are maintained and furnished by private corporations. Other records are maintained by this Department and others by the State Water Supply Commission and the United States Geological Survey. Some of these are maintained in coöperation with private corporations. Some of the records are at dams and mills and others are at current-meter stations. At some, the conditions are known to be good; at others they are poor at certain seasons of the year.

Some of these records are of long duration, notably the record at Mechanicville, established in December, 1888, and the record at Fort Edward, established in December, 1895. Most of the records are, however, of much shorter duration and it is only within the past two or three years that a sufficient number of gaging stations has been maintained in this basin to enable reliable comparisons of the different records to be made. The results of gagings at many of these stations are now for the first time available and a thorough study of the results, with a view to determining the relative accuracy of the different records, has been undertaken, but has not been carried far enough at this time to enable final conclusions to be drawn. It appears quite certain, however, that the record of the West Virginia Pulp & Paper Company's dam in Mechanicville is substantially accurate in its present form, although this record in earlier years was probably somewhat in error in regard to high-water conditions, owing to the use of a less reliable formula for discharge over the dam than that at present applied. It also appears that the record at Crocker's Reef dam, maintained by this Department, beginning in 1907, is probably very reliable, as the conditions are exceptionally good. It has been known for several years that the calculated discharge at Fort Edward was probably somewhat in error, especially during the low-water season. In view of the fact that no reliable basis existed for determining the correct discharge and making the necessary modifications in this record, it has seemed best to continue the computation of the record in the same manner pursued from its inception. In applying the Fort Edward data it should be understood that the low-water flow as recorded is probably somewhat excessive throughout the entire record.

As to other records of the Hudson river and tributaries it can only be said at this time that they are probably more consistent than would appear from a direct comparison. In some cases where the recorded run-off per square mile at adjacent stations differs, it does not necessarily follow that either one of the records is incorrect. There are wide variations in the hydrological conditions in different portions of the upper Hudson drainage basin. For example, the topography, culture, geology and soil for the Hudson and its tributaries above North Creek are all essentially different from the corresponding features of the drainage basin of Saratoga lake outlet. The hydrological features of both the above mentioned basins are essentially different from the corresponding features of the drainage basins of the Battenkill and Hoosic streams. The conditions are somewhat further complicated by diversion from the Hudson river to supply the Champlain canal through Glens Falls feeder and at Northumberland dam.

HUDSON RIVER ABOVE DAM OF HUDSON RIVER ELECTRIC POWER CO., NEAR MECHANICVILLE, N. Y.

This gage was established August 18, 1905, by this Department. The gage is a vertical staff divided to feet and tenths and reading from zero to 16 feet. It is attached to the up-stream face of the river wall at the right-hand end of the line of waste-gates forming a continuation of the dam. Readings are taken at 8 A. M. and 5 P. M. by H. C. Tinker. The gage zero is at elevation 43.00. A record is kept in the adjoining power-plant, showing the use of water by the turbine wheels, and also the waste over the dam, through gates, etc.

The accompanying tables show the discharge as calculated at the power plant. The dam is of the ogee type, but the discharge is calculated by the East Indian Engineers' formula for dams with broad crest.

The record of the flow of Hudson river at this plant was begun October 1, 1897, and the accompanying tables show the complete record year by year, including certain recent years, records for which have appeared in previous reports of the State Engineer.

Acknowledgment is made to the Hudson River Electric Power Company for furnishing copies of this record for the earlier years during which it was kept.

Mean Daily Discharge, Second-feet, of Hudson River at Dam of Hudson River Electric Power Co., near Mechanicville, N. Y.

DAY.	Oct.	Nov.	Dec.
1897.			
1	2,290	2,150	17,121
2	2,245	3,475	15,655
3	3,065	10,550	13,539
4	2,290	10,149	14,466
5	2,170	8,817	13,509
6	2,150	7,314	20,531
7	2,150	5,915	16,404
7	2,150	5,752	15,435
9	2,150	5,752	14,437
10	3,180	9,266	13,462
11	2,150	9,224	12,927
12	2,150	11,254	13,000
13	2,450	12,243	17,150
14	3,000	13,768	15,559
15	3,135	10,794	31,178
16	3,065	10,000	35,706
17	4,110	13,300	32,515
18	2,664	11,800	29,702
19	2,900	11,620	23,114
20	2,660	10,650	15,379
21	2,370	8,628	12,207
22	2,346	9,354	8,486
23	2,150	8,182	6,900
24	3,070	7,451	4,819
25	2,290	6,368	2,785
26	2,150	7,395	2,293
27	2,150	15,402	4,122
28	2,150	15,848	7,047
29	2,150	19,456	6,467
30	2,150	16,984	6,467
31	3,133	......	6,467
Mean	2,047	16,029	7,917

Mean Daily Discharge, Second-feet, of Hudson River at Dam of Hudson River Electric Power Co. near Mechanicville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Avg.	Sept.	Oct.	Nov.	Dec.
1898.												
1......	5,512	5,335	5,118	19,300	13,500	10,128	2,075	2,917	4,385	3,424	8,953	7,847
2......	4,689	5,095	5,004	18,925	12,310	9,420	3,363	3,117	3,866	3,024	9,227	6,880
3......	5,035	5,272	5,021	16,000	10,418	7,540	3,130	6,188	4,779	2,197	8,232	5,943
4......	5,186	4,151	4,986	14,718	11,527	6,740	2,077	5,658	4,477	1,907	8,254	5,938
5......	5,306	4,353	5,021	12,718	11,307	5,200	3,728	5,809	5,414	6,285	6,404	5,701
6......	5,485	6,475	3,938	11,418	12,914	5,784	2,756	5,8 9	4,569	24,538	7,121	7,008
7......	6,626	5,203	5,021	10,600	11,824	5,030	2,511	3,800	4,061	11,797	6,852	8,115
8......	7,256	5,000	5,118	9,438	9,500	4,730	2,371	5,019	6,551	9,366	6,780	6,554
9......	5,890	4,826	6,368	8,728	10,014	4,530	......	4,552	4,561	10,304	7,587	5,037
10......	6,168	4,826	7,103	7,400	9,452	4,230	......	3,982	4,257	8,626	5,921	5,431
11......	5,951	6,325	9,260	8,535	8,346	3,795	......	3,869	3,156	7,532	21,456	4,124
12......	5,298	10,022	16,497	8,235	8,950	3,100	......	3,620	4,020	7,176	18,825	4,241
13......	11,499	13,042	25,153	9,228	11,840	4,640	......	3,620	3,692	7,195	16,548	4,146
14......	10,975	10,425	36,736	10,528	11,330	5,220	......	2,077	2,667	5,804	15,249	3,318
15......	10,160	9,074	35,329	10,528	9,800	8,290	2,216	3,225	3,468	8,340	13,511	3,311
16......	10,147	8,100	31,135	12,918	10,660	7,280	2,159	3,225	2,936	9,509	12,921	3,952
17......	9,672	5,682	29,786	12,450	10,780	6,050	1,055	3,198	4,134	10,000	11,346	4,513
18......	7,515	7,480	30,085	12,918	11,380	4,890	2,192	3,135	5,234	9,047	10,455	4,509
19......	7,008	7,788	27,804	11,954	10,090	4,400	2,224	3,353	2,645	8,149	10,806	4,251
20......	7,952	7,571	27,782	11,948	10,060	5,950	2,175	4,717	3,926	8,203	14,122	4,517
21......	13,757	8,009	33,867	11,658	9,110	4,800	2,192	2,983	2,518	8,641	15,266	4,613
22......	10,170	7,906	32,204	10,818	7,200	4,720	3,029	4,692	2,191	8,069	12,265	4,429
23......	9,780	7,258	29,131	10,505	8,960	4,610	3,624	3,982	2,343	7,509	11,554	5,813
24......	11,458	6,524	25,866	10,580	8,960	4,760	2,077	5,352	2,290	8,754	10,873	9,967
25......	9,436	6,263	23,372	21,270	10,158	4,285	3,592	....	7,091	8,735	10,945	8,820
26......	8,628	5,992	20,390	25,060	12,745	3,600	4,542	....	7,952	8,052	10,046	8,031
27......	7,788	5,294	17,766	25,100	15,540	4,380	4,257	....	7,510	9,903	8,990	6,336
28......	7,719	5,911	18,106	21,265	16,230	3,728	3,715	....	5,134	12,652	4,339	5,060
29......	6,624	......	18,660	19,120	14,700	3,728	3,465	....	4,062	12,142	7,052	4,780
30......	5,361	......	21,570	15,730	13,928	3,308	3,198	....	3,581	11,076	6,876	4,784
31......	4,860	......	20,980		11,130		1,794	....	3,424	11,285	......	5,347
Mean...	7,917	6,242	18,844	12,572	9,922	4,932	2,810	4,079	4,255	8,685	10,742	5,590

Mean Daily Discharge, Second-feet, of Hudson River at Dam of Hudson River Electric Power Co., near Mechanicville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1899.												
1.....	4,025	3,229	9,288	9,411	27,782	3,753	1,728	1,476	1,354	4,776	3,981	2,891
2.....	4,602	3,223	7,981	8,406	29,017	4,493	1,659	974	1,153	4,298	7,467	3,480
3.....	4,319	3,669	7,016	9,101	28,795	3,685	2,538	1,244	639	3,867	13,178	3,735
4.....	5,248	3,679	7,180	9,293	24,760	3,113	232	1,392	596	2,552	12,208	4,652
5.....	10,519	3,375	7,364	11,325	20,639	3,016	1,250	771	1,908	2,120	11,818	7,424
6.....	9,692	3,673	22,120	11,826	17,945	2,836	1,359	435	1,881	2,588	11,231	5,673
7.....	9,771	3,780	14,535	13,950	14,617	2,197	1,275	1,380	1,737	2,100	10,256	4,498
8.....	7,748	3,140	10,448	21,217	13,067	2,458	962	1,347	1,454	2,069	9,112	4,293
9.....	8,755	2,035	10,305	18,801	11,590	2,010	488	1,325	980	1,850	7,467	3,262
10.....	7,272	2,386	9,239	17,451	10,402	1,704	2,741	1,352	211	1,881	6,338	......
11.....	6,587	2,045	8,765	17,831	9,106	......	3,834	595	1,411	2,364	5,723	2,963
12.....	5,977	2,523	8,315	18,940	9,195	2,388	2,831	1,438	1,333	2,495	6,147	3,483
13.....	6,061	2,550	17,611	19,537	8,696	2,172	3,027	625	1,350	2,677	5,688	9,863
14.....	6,433	2,621	13,133	22,901	7,911	1,723	2,366	783	1,325	1,975	5,277	15,502
15.....	10,009	2,160	11,800	28,507	8,857	1,717	2,012	1,450	1,419	1,598	4,536	15,108
16.....	10,279	2,090	11,058	32,286	9,250	3,429	2,162	1,392	790	1,376	4,350	13,443
17.....	10,792	2,630	10,048	32,687	7,343	3,386	2,078	1,479	401	2,229	4,744	9,664
18.....	11,495	2,820	8,966	30,009	6,689	3,299	3,135	1,352	1,517	1,418	3,913	9.591
19.....	8,621	3,098	9,874	29,477	5,377	2,735	3,332	994	1,370	1,512	4,307	10,317
20.....	7,473	3,570	11,557	34,126	5,585	1,820	2,109	213	1,370	1,960	3,890	10,655
21.....	7,087	3,930	12,052	35,349	7,978	1,854	1,954	1,385	1,370	1,997	4,621	11,037
22.....	6,361	4,310	10,448	35,861	7,784	2,336	2,376	1,330	1,374	206	4,410	10,626
23.....	5,985	14,028	9,876	35,585	6,063	1,547	947	684	1,333	2,030	3,969	9,776
24.....	5,806	9,180	9,770	37,251	5,688	1,534	2,570	1,341	647	2,149	4,130	8,208
25.....	7,740	7,571	9,671	38,351	5,599	330	2,015	1,409	1,468	2,233	3,342	8,714
26.....	6,810	5,325	8,314	39,943	4,953	1,636	2,126	1,404	1,999	2,222	2,086	5,942
27.....	5,420	5,503	8,165	38,404	4,385	1,099	1,851	644	7,162	2,460	3,590	5,818
28.....	5,479	12,253	8,383	36,912	4,203	1,735	1,760	1,406	6,757	2,226	3,342	4,698
29.....	4,686	......	8,184	34,486	3,927	1,300	1,837	1,425	6,474	211	2,889	3,705
30.....	4,677	......	9,426	30,834	3,686	2,122	235	1,392	6,093	2,421	3,348	3,051
31.....	4,311	......	8,473	......	4,126	......	2,366	1,321	......	2,954	......	2,912
Mean...	7,099	4,300	10,302	25,336	10,806	2,270	1,973	1,154	1,962	2,152	5,906	9,196

Mean Daily Discharge, Second-feet, of Hudson River at Dam of Hudson River Electric Power Co., near Mechanicville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1900.												
1......	2,920	5,565	6,562	10,654	19,263	4,439	594	2,048	1,904	2,779	2,265	9,986
2......	2,368	3,743	20,574	12,617	18,439	5,834	1,400	2,079	1,117	1,263	1,530	7,504
3......	2,346	4,253	13,199	13,226	17,351	4,055	1,529	1,553	1,117	1,294	1,923	7,153
4......	2,479	3,049	11,006	13,911	16,904	8,968	1,238	1,592	1,465	1,508	1,614	5,645
5......	2,763	4,385	9,161	13,911	14,163	6,764	1,617	778	2,110	1,396	1,957	12,016
6......	2,928	6,071	8,309	14,914	11,825	6,224	1,203	1,567	1,744	1,033	1,314	10,461
7......	3,167	5,188	16,172	17,788	10,604	6,366	1,214	1,478	1,676	1,221	1,745	9,733
8......	3,495	5,186	9,011	21,782	13,347	5,614	716	1,691	1,391	2,167	1,203	9,455
9......	3,199	20,404	8,475	22,274	11,362	4,580	1,517	1,991	475	1,481	1,203	7,748
10......	2,712	14,694	9,023	19,798	10,689	4,932	1,203	2,332	1,325	1,422	1,502	6,874
11......	2,308	10,132	8,441	17,670	12,550	5,677	1,193	1,686	1,330	1,500	3,455	3,114
12......	2,536	8,452	8,261	16,959	10,581	5,339	1,207	1,501	1,213	1,377	2,725	3,258
13......	2,164	24,034	6,954	17,151	8,911	4,121	1,210	2,310	1,504	2,220	3,305	4,396
14......	1,915	47,291	7,338	16,353	10 397	4,589	1,207	2,240	1,211	830	3,197	4,273
15......	2,631	28,189	7,581	13,143	9,545	4,013	630	1 990	1,015	1,542	2,782	4 355
16......	2 549	25 488	5 339	15,775	10,389	4,298	1,515	3,006	1,009	1,700	2,559	2,476
17......	2,543	20,243	5,341	17,672	10,022	2,618	1,203	5,358	1,504	1,700	2,725	3 407
18......	2,473	19,489	4,673	23,982	9,005	3 534	1,203	5,084	1,409	1,739	2,268	3,285
19......	2,611	17,313	6,744	34,106	9,040	4,046	1,205	3,795	1,321	1,022	2,340	3,583
20......	9,457	14,380	22,202	42,308	12,280	3,166	1,189	2,752	1,530	1,504	2,603	3,250
21......	20,200	12,542	13,369	44,372	12,500	2 067	1,189	3,095	1,225	617	3,773	3,048
22......	13,793	11,648	11,111	43,181	11,087	1,695	410	2,303	1,393	1,618	10,078	2,760
23......	11,820	16,259	10,201	43,958	9,760	2,164	1,414	1,938	745	1,298	11,041	2,114
24......	10,607	11,741	10,104	43,036	9,580	1,823	1,210	2,090	1,231	1,521	11,086	2,764
25......	9,756	12 157	8,085	40,838	9,253	1,990	1,210	2,219	1,496	1,781	8,040	5,748
26......	9,729	9,131	9,473	36,916	7,417	2,195	1,747	900	1,404	1,786	10,049	4,863
27......	7,356	7,230	8,653	31,393	4,619	2,011	2,378	1,465	1,503	1,769	13,582	4,353
28......	6,463	6,619	9,206	28,419	7,953	1,983	4,090	1,252	2,240	1,330	13,008	4,099
29......	6,487	......	10 044	22 688	6,626	1,409	2,628	1,793	2,066	1,811	12,893	3,132
30......	5,221	......	10,380	22,649	4,715	1,804	2,621	1,580	1,617	2,784	11,611	6,458
31......	5,307	......	11,150	......	4,353	......	2,487	1,816	......	2,665	......	4,099
Mean...	5,364	13,388	9,875	24,782	10,791	3,943	1,428	2,169	1,411	1,602	4,978	5,332

Mean Daily Discharge, Second-feet, of Hudson River at Dam of Hudson River Electric Power Co., near Mechanicville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1901.												
1......	3,806	1,576	1,772	17,488	20,271	14,127	3,893	5,369	2,084	4,280	3,337	2,024
2......	3,681	2,356	2,215	16,930	19,374	12,692	3,681	4,940	2,761	4,789	3,296	3,321
3......	3,303	1,482	1,442	16,366	16,539	12,638	3,648	4,267	5,253	3,799	2,894	3,414
4......	2,841	2,636	1,763	20,258	16,552	13,708	2,209	2,135	5,026	3,325	3,893	3,388
5......	2,646	2,514	1,776	14,553	22,325	13,145	1,954	2,889	4,998	3,307	3,275	3,486
6......	2,171	2,122	2,281	19,444	13,123	11,583	3,146	2,274	4,916	2,574	3,716	2,945
7......	2,625	2,174	2,133	25,266	12,000	11,073	2,420	2,529	4,585	4,140	3,893	2,552
8......	2,763	1,924	1,482	37,743	10,553	15,490	2,935	4,806	3,789	3,611	3,611	2,214
9......	2,800	1,603	1,875	36,963	10,347	16,342	3,126	5,397	3,818	3,078	3,622	3,835
10......	2,769	1,567	2,577	33,564	10 061	14,894	2,918	6,667	3,630	3,085	2,938	3,765
11......	2,756	1,553	3,520	30,392	9,869	13,630	2,891	3,577	2,930	3,253	3,192	9,939
12......	2,850	1,553	18,376	26,509	9,863	12,130	3,834	6,576	2,946	3,273	3,611	9,682
13......	1,961	1,548	7,845	25,358	10,980	10,093	3,634	5,757	2,912	2,473	5,147	7,480
14......	2,915	2,156	5,799	25,213	11,936	9,190	2,627	4,955	4,286	4,911	5,009	8,265
15......	2,767	1,880	5,161	25,796	11,358	8,869	2,192	3,587	3,763	5,076	5,083	18,684
16......	1,978	1,744	4,588	25,779	12,555	11,281	2,921	3,766	4,998	7,657	4,862	34,329
17......	4,600	1,166	4,546	26,525	10,539	10,373	2,202	3,943	4,656	7,347	3,630	20,776
18......	4,416	1,469	4,093	26,679	10,441	5,309	2,197	3,577	5,013	6,377	4,328	20,473
19......	2,957	2.314	4,755	28,046	14,488	4,677	2,042	4,148	3,296	5,090	4,367	17,178
20......	1,592	1,886	4,570	27,762	15,287	4,817	2,946	2,804	4,682	3,715	3,622	12,556
21......	2,515	1,755	7,834	20,776	17,555	4,105	2,622	4,656	3,882	4,994	3,670	10,025
22......	3,075	1,719	21,913	39,727	14,570	5,464	3,004	4,893	2,682	4,636	2,804	4,890
23......	2,884	1,824	13,688	49,098	12,779	10,425	2,912	4,870	3,735	4,994	3,226	5,376
24......	1,960	1,175	12,315	53,947	15,100	8,743	2,921	4,458	3,324	4,601	2,331	6,659
25......	2 342	1,470	12,306	50,661	13,123	8,287	2,900	6,294	2,959	4,200	2,998	5,717
26......	2,878	2,062	17,927	44,851	13,771	6,836	2,179	6,401	2,544	3,653	3,689	6,544
27......	2,167	2,047	22,826	35,235	11,457	5,576	2,159	4,916	3,286	2,455	3,450	6,778
28......	2,801	1,176	23,206	29,069	14,132	5,404	1,575	4,477	3,625	3,834	2,338	5,689
29......	2,299	......	20,629	24,392	14,070	4,726	2,191	4,477	3,154	3,758	2,592	4,615
30......	2,061	......	18,168	22,111	14,121	3,80	4,233	4,298	4,664	3,653	2,568	11,362
31......	2,349	......	17,516	......	14,570	.....	4,706	3,394	......	3,276	......	11,258
Mean...	2,760	1,800	8,729	29,212	13,667	9,660	2,868	4,422	3,806	4,168	3,568	8,689

Mean Daily Discharge, Second-feet, of Hudson River at Dam of Hudson River Electric Power Co., near Mechanicville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1902.												
1	3,848	5,230	36,437	30,849	21,922	6,211	6,730	6,765	3,203	6,096	21,310	5,010
2	5,339	5,068	29,863	24,617	21,291	7,396	6,730	8,089	3,823	6,096	13,618	4,706
3	5,339	5,578	44,288	24,488	16,479	6,485	6,765	9,011	3,823	7,350	11,299	4,623
4	4,565	3,863	32,390	21,491	16,703	5,885	11,458	9,104	3,693	5,968	10,235	5,926
5	3,282	4,290	31,547	18,672	15,829	6,941	15,116	8,444	3,635	5,134	8,928	5,926
6	5,151	3,195	23,587	15,751	15,579	7,093	13,588	7,968	3,647	4,819	9,144	5,138
7	5,069	3,323	25,836	14,577	15,166	6,622	12,072	8,395	2,356	4,662	7,718	4,760
8	4,997	3,457	20,489	13 437	13,357	5,784	10,046	9,366	4,009	5,145	7,292	4,541
9	5,074	3,024	19,740	13,717	11,136	6,941	8,482	9,366	4,515	5,459	6,441	4,099
10	5,194	4,611	18,018	23,295	11,121	6,181	7,483	9,022	4,165	5,459	6,729	4,127
11	5,209	3,050	16,643	28,726	10,228	6,789	7,467	8,840	4,339	4,330	5,947	4,505
12	3,354	3,304	19,740	27,151	8,489	6,485	7,093	10,682	4,819	4,185	5,092	4,492
13	3,934	3,168	23,879	25,575	7,420	6,485	7,448	9,380	4,917	4,819	5,112	4,505
14	3,158	3,290	28,027	22,535	7,284	6,014	6,181	7,981	4,240	4,350	5,416	3,806
15	2,882	3,151	28,734	16,037	7,116	5,711	5,501	6,751	5,500	3,917	8,098	4,579
16	4,490	2,205	29,058	9,424	6,037	6,166	5,501	6,751	4,304	4,248	7,819	4,496
17	3,557	3,123	30,303	11,810	6,660	7,093	6,618	4,920	3,613	4,819	7,673	4,572
18	3,572	2,568	45,449	11,831	5,802	7,230	6,470	5,791	3,669	4,971	3,916	29,575
19	2,971	2,900	40,380	11,252	5,622	7,093	5,862	5,330	3,624	4,185	7,064	13,996
20	3,602	3,040	33,734	13,451	5,359	6,517	6,373	5,004	2,882	6,035	6,226	12,093
21	2,858	3,344	28,123	11,745	7,436	5,862	13,639	5,004	1,753	7,317	6,640	13,892
22	2,818	3,280	27,289	10,067	5,705	6,015	13,939	5,086	3,136	6,105	5,500	12,401
23	10,634	2,473	25,261	10,421	4,997	7,396	12,737	5,004	2,919	6,166	5,922	17,635
24	7,114	3,625	24,076	11,606	5,179	7,078	12,151	3,982	2,971	6,120	5,848	17,635
25	6,166	3,179	30,374	9,659	3,529	6,455	12,739	5,004	2,936	5,317	5,381	16,238
26	5,528	3,291	29,155	8,668	7,515	5,862	12,151	4,661	2,988	5,317	5,314	16,258
27	7,734	7,329	25,992	9.514	7,518	6,166	10,603	4,482	3,153	5,209	5,010	14,862
28	9,558	9,813	18,310	13,268	14,805	7,237	11,113	4,304	2,962	7,323	5,533	11,232
29	6,139	......	22,535	12,427	12,072	6,070	10,419	4,092	4,905	18,409	5,229	11,232
30	5,598	......	28,726	12,174	10,446	6,767	9,367	3,937	6,081	17,664	4,621	9,680
31	5,422	......	30,849	......	10,466	......	8,075	2,937	......	18,811	......	5,710
Mean...	4,792	4,462	28,028	16,305	10,268	6,534	9,352	6,672	3,754	6,574	7,302	9,104

Mean Daily Discharge, Second-feet, of Hudson River at Dam of Hudson River Electric Power Co., near Mechanicville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1903.												
1	9,955	10,733	25,838	24,452	5,982	2,341	9,235	4,899	10,597	4,279	6,009	4,435
2	9,196	11,350	19,056	23,411	6,031	2,334	8,809	4,228	9,578	2,612	5,861	4,445
3	8,299	10,831	17,634	21,207	5,616	2,299	8,809	5,378	8,650	2,497	5,543	4,051
4	10,959	11,196	13,174	23,020	6,031	2,354	7,611	4,778	8,170	755	4,422	5,068
5	10,439	16,631	15,200	24,943	13,669	3,225	8,071	4,760	6,997	1,649	504	4,083
6	9,661	12,461	15,030	24,849	5,587	2,299	6,140	5,766	5,139	2,561	5,161	3,351
7	8,973	11,333	14,039	24,922	6,003	7,477	6,230	7,259	5,583	3,565	5,268	4,377
8	8,560	10,247	14,941	21,516	5,544	2,341	5,507	7,259	5,063	3,459	4,906	3,979
9	9,196	8,801	27,949	21,516	6,118	3,093	4,599	7,394	4,887	3,417	4,806	4,036
10	6,662	9,059	26,368	20,468	5,591	2,347	4,653	5,851	4,259	24,815	5,259	3,293
11	9,478	8,390	42,277	20,150	4,769	4,869	4,795	5,720	4,259	24,545	5,298	3,265
12	5,702	15,156	44,342	20,889	4,742	9,823	3,891	5,890	4,310	15,811	4,970	3,282
13	5,184	14,284	44,345	17,996	3,965	13 025	3,372	8,266	4,284	17,633	4,970	3,007
14	5,129	12,461	41,529	15,724	4,813	13,710	4,215	8,266	4,247	16,335	4,790	4,724
15	6,084	11,652	39,012	13,980	4,813	13,580	5,087	7,105	4,247	13,782	3,287	4,664
16	5,101	9,772	32,000	13,409	4,787	13,322	4,944	5,789	3,304	10,769	5,738	5,115
17	6,126	7,515	28,768	12,214	3,061	9,662	4,216	5,741	2,423	8,876	5,269	3,997
18	6,927	7,515	26,412	14,655	4,051	8,873	4,113	5,507	4,247	8,058	7,805	4,102
19	4,966	7,611	24,485	11,912	4,051	9,461	3,250	4,884	4,310	12,831	8,652	4,014
20	4,678	7,026	25,251	11,892	3,439	7,328	4,276	5,774	4,319	14,829	6,170	2,380
21	4,695	7,027	28,026	9,301	4,024	9,325	4,204	6,543	3,474	13,803	5,506	12,450
22	5,108	7,229	36,672	8,649	4,024	20,438	4,074	4,113	4,252	12,637	4,437	9,334
23	7,128	6,594	40,238	7,784	3,936	18,900	4,928	4,302	3,446	10,730	5,351	5,943
24	6,148	8,146	43,646	7,605	742	17,602	10,718	5,840	2,490	10,757	5,215	6,390
25	6,053	6,934	49,737	7,621	4,009	18,240	7,991	5,699	2,602	8,987	5,050	6,180
26	5,892	6,630	49,020	8,445	2,299	18,240	6,904	5,656	3,511	10,088	3,906	6,242
27	5,615	6,648	39,046	7,367	2,229	17,623	5,899	9,106	2,052	7,724	3,102	4,584
28	5,892	9,376	39,210	5,846	1,547	15,718	4,724	8,207	2,563	8,209	3,263	4,224
29	4,828	......	27,156	6,879	1,625	12,177	3,897	7,210	3,526	6,994	2,555	4,224
30	9,943	......	23,620	5,567	2,337	10,630	4,760	7,293	2,536	6,151	4,257	4,525
31	12,378	......	24,415	......	887	......	4,795	10,576	......	5,496	......	4,140
Mean...	7,260	9,372	30,233	14,783	4,398	9,689	5,632	5,918	4,680	7,992	4,911	4,258

Mean Daily Discharge, Second-feet, of Hudson River at Dam of Hudson River Electric Power Co., near Mechanicville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1904.												
1.....	4,044	4,806	4,456	14,833	29,725	5,814	3,116	4,797	3,038	16,200	8,703	3,280
2.....	3,112	3,863	4,374	18,491	29,784	5,835	3,982	4,125	2,207	17,164	7,683	4,065
3.....	3,310	3,568	4,130	17,731	27,906	4,862	859	3,152	3,598	15,201	6,886	3,391
4.....	3,636	3,140	9,336	20,786	26,879	3,634	915	4,185	4,144	31,678	6,269	2,338
5.....	3,128	2,973	6,050	16,011	24,886	3,037	4,816	3,152	5,015	9,090	6,194	3,452
6.....	3,569	3,225	6,637	19,217	23,361	4,987	4,792	2,862	5,257	10,246	6,444	3,455
7.....	3,208	3,022	5,675	20,507	20,434	5,376	4,829	5,360	5,565	9,305	6,820	4,241
8.....	3,885	10,994	13,608	23,553	22,921	7,930	4,829	8,023	4,328	8,023	6,138	2,094
9.....	3,965	7,873	11,412	28,796	16,367	20,665	5,235	3,873	3,398	4,627	5,087	4,211
10.....	2,278	5,503	11,721	30,024	15,691	25,531	4,254	3,183	2,182	6,965	5,010	1,686
11.....	3,831	5,949	10,553	38,210	15,709	17,076	5,045	3,126	3,416	5,916	5,256	510
12.....	3,975	5,970	9,530	35,715	14,111	11,528	5,045	3,231	3,850	77,796	4,199	2,680
13.....	3,657	6,030	8,072	33,645	9,992	15,135	3,967	3,117	3,850	10,813	3,075	1,705
14.....	3,068	4,790	8,278	28,878	8,928	10,193	3,967	3,116	3,044	10,173	5,807	1,534
15.....	2,844	5,760	8,096	24,827	7,554	8,516	3,983	3,446	9,845	9,160	4,839	1,666
16.....	3,081	5,173	7,245	21,824	5,330	7,530	3,967	2,318	4,668	3,092	6,022	1,666
17.....	2,474	4,741	6,527	17,604	12,476	7,445	911	2,466	8,945	7,529	5,010	2,435
18.....	3,029	4,472	6,533	19,007	13 116	5,811	3,951	3,191	2,426	7,094	5,067	2,097
19.....	3,133	3,854	6,666	15,958	10,621	4,083	3,982	3,141	6,976	5,970	4,171	1,883
20.....	3,003	4,004	6,009	16,983	12,232	5,435	3,921	3,045	4,981	5,005	2,031	2,580
21.....	3 277	3,153	8,763	15,353	15,377	4,538	3,921	5,568	4,847	5,218	4,980	2,620
22.....	2 226	4,346	8,384	14,795	8,097	2,797	5,998	9,033	4,125	15,781	5,882	2,744
23.....	3,260	4,885	9,281	13,605	9,910	3,726	2,479	2,529	4,201	25,536	4,113	2,763
24.....	9,674	6,253	14,756	12,651	8,964	5,170	718	1,953	3,981	22,246	4,823	2,717
25.....	7,001	5,340	14,201	14,974	8,40[illegible]	5 194	3,092	3,353	3,191	17,812	5,487	1,413
26.....	5,847	4,929	22,966	17,393	7,768	2,297	2,661	8,228	5,882	10,129	5,827	3,491
27.....	5,109	4,593	23,047	19,147	8,370	3,389	2,249	5,208	5,698	17,136	2,692	3,876
28.....	4,435	3,823	22,258	20,912	7,770	3,860	2,379	5,116	5,723	11,801	4,221	21,698
29.....	3,897	4,681	14,833	24,198	6,593	3,080	3,748	4,437	5,738	11,478	4,849	10,157
30.....	3,914	.....	15,546	27,658	6,725	3,080	3,951	3,263	9,427	9,603	4,887	8,052
31.....	3,728	......	16,259	......	7,768	......	1,848	2,198	......	9,548	.....	7,247
Mean...	3,825	5,014	10,480	21,710	13,012	7,248	3,464	3,830	4,853	11,274	5,582	3,540

Mean Daily Discharge, Second-feet, of Hudson River at Dam of Hudson River Electric Power Co., near Mechanicville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1905.												
1.....	7,084	2,843	2,981	40,426	9,637	4,690	9,184	11,167	4,450	5,688	5,263	9,867
2.....	8,788	3,043	3,334	39,826	10,041	5,471	7,006	11,974	3,578	6,872	5,463	8,209
3.....	7,765	3,389	2,917	33,526	11,368	4,090	11,389	9,282	4,878	6,872	6,443	10,224
4.....	5,352	2,404	2,515	28,020	8,964	2,400	12,095	7,448	12,441	6,262	6,747	23,541
5.....	4,204	1,833	1,176	24,249	9,482	4,236	13,507	4,398	17,868	6,047	5,595	20,105
6.....	4,734	4,201	1,986	26,476	9,482	4,669	12,464	4,425	21,734	5,295	7,844	11,883
7.....	5,645	3,284	2,073	29,857	8,071	4,193	11,442	5,416	18,851	6,961	8,274	9,398
8.....	12,182	3,075	2,527	26,388	8,994	4,109	9,979	6,271	16,756	3,826	6,617	11,654
9.....	9,789	2,594	2,765	22,234	8,051	6,325	8,211	6,964	13,102	7,957	8,790	12,582
10.....	7,160	4,535	2,073	22,012	8,451	12,079	7,949	4,758	9,422	6,406	7,934	13,015
11.....	7,228	2,928	2,715	16,670	8,374	8,227	7,295	5,806	11,813	4,378	8,441	7,774
12.....	7,225	1,795	2,209	21,486	8,454	7,021	6,053	7,666	11,759	5,012	6,104	7,245
13.....	9,400	2,513	2,244	21,268	6,487	7,365	5,856	7,154	11,327	5,199	8,040	6,853
14.....	9,094	2,523	3,032	20,740	6,651	7,320	5,438	7,056	10,796	10,832	6,864	6,851
15.....	5,025	2,902	2,451	20,246	7,107	7,728	5,268	4,581	9,394	8,932	6,543	3,794
16.....	5,519	2,479	2,391	16,900	6,273	6,826	3,300	6,301	7,821	9,360	6,566	5,039
17.....	5,832	2,538	3,084	16,316	7,483	6,021	4,375	8,094	6,742	7,005	6,273	4,024
18.....	5,690	2,519	3,027	13,624	6,699	3,996	5,004	9,916	8,455	6,350	6,273	4,360
19.....	5,750	1,185	10,998	11,149	6,667	7,348	4,871	8,123	16,465	5,815	4,709	6,339
20.....	5,453	1,596	6,803	10,774	5,882	8,962	4,621	5,734	18,704	5,819	5,780	3,936
21.....	5,422	1,810	5,275	10,235	5,551	11,824	4,861	7,916	21,462	7,376	4,729	5,853
22.....	4,013	2,350	5,062	10,599	6,514	17,340	4,966	8,051	21,036	11,145	4,458	8,434
23.....	5,039	3,097	2,664	15,110	6,026	15,329	2,294	4,564	17,464	7,945	4,133	8,434
24.....	4,358	2,221	6,379	15,170	5,158	12,969	4,304	3 857	14,144	7,351	4,476	7,234
25.....	4,602	2,729	3,982	12,195	5,146	10,180	4,447	3,351	14,215	7,264	3,793	4,130
26.....	2,655	925	13,109	13,587	4,496	10,387	4,405	3,991	11,421	6,374	3,256	6,575
27.....	3,466	2,212	19,082	11,500	4,387	12,158	4,165	3 265	8,557	5,862	4,664	5,886
28.....	3,488	3,207	19,996	11,575	4,188	12,621	4,003	2,336	8,605	5,727	4,925	5,721
29.....	3,296	......	19,699	10,000	5,534	12,334	3,764	3,425	8,484	4,013	4,830	5,512
30.....	3,158	......	27,147	8,921	5,117	11,167	5 3 7	2,336	7,655	7,051	13,312	6,383
31.....	3,250	......	35,573	......	3,988	......	7,363	5,8[illegible]9	.....	5,724	......	6,485
Mean...	5,827	2,562	7,138	19,400	7,020	8,313	6,842	6,160	12,448	6,660	6,238	8,290

Mean Daily Discharge, Second-feet, of Hudson River at Dam of Hudson River Electric Power Co., near Mechanicville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1906.												
1......	7,505	9,667	5,747	13,397	13,106	15,042	6,497	4,282	2,183	3,278	4,112	5,430
2......	9,196	7,915	5,332	13,713	12,211	10,647	12,861	3,887	1,474	2,120	3,937	3,805
3......	6,303	6,229	5,857	9,694	16,261	9,973	12,358	3,341	1,226	2,345	3,960	5,816
4......	6,429	5,895	26 067	12,140	16,241	8,979	8,635	3,857	2,545	2,413	1,796	4,292
5......	8,123	6,417	17,894	14,871	15,436	7,963	7,862	2,865	2,383	2,413	2,904	4,942
6......	7,768	4,534	15,383	16,783	13,298	6,577	7,388	3,244	2,108	2,354	2,891	2,528
7......	6,743	4,481	12,356	15,605	14,300	7,416	6,928	3,940	3,405	2,450	2,933	6,255
8......	6,061	4,627	9,260	14,380	11,859	7,332	5,239	2,782	2,698	3,182	3,073	5,458
9......	6,446	4,863	9,990	12,311	12,713	7 737	7,530	2,852	2,161	2,336	2,934	3,334
10......	4,343	5,111	9,755	11,924	15,863	10,598	4,885	3,153	3,850	1,638	2,856	2,658
11......	4,448	4,062	8,844	15,588	14,128	12,477	5,078	3,069	2,775	2 778	2,745	3,245
12......	5,015	5,735	8,927	13,523	12,695	14,205	5,061	2,502	2,595	3,194	4,493	4,724
13......	7,069	5,570	7,636	13,908	9,290	8,959	5,060	3,597	2,823	2,246	4,316	3,588
14......	5,176	5,475	6,576	14,896	13,142	9,000	4,009	2,866	2,301	454	4,871	3,172
15......	6,442	5,113	4,308	19,939	14,432	6,979	3,575	2,424	2,253	3,182	3,115	3,775
16......	5,819	5,541	5,014	37,178	14,105	7,504	5,642	2,789	1,390	1,679	3,169	4,683
17......	7,151	4,421	5,871	30,715	11,505	6,338	4,367	2,266	2,636	2,318	2,665	5,737
18......	5,854	3,279	3,640	30,165	9,532	8,212	4,886	2,133	1,916	2,422	6,150	5,783
19......	6,052	5,851	6,691	28,763	9,027	8,211	4,027	345	2,238	2,432	5,903	5,181
20......	5,376	5,325	4,920	29,320	10,116	7,120	2,463	2,511	2,303	3,169	8,375	5,973
21......	3,623	5,559	5,102	28,908	8,381	6,533	3,525	1,933	2,699	3,226	7,806	4,670
22......	2,596	10,376	5,219	27,192	7,891	6,085	776	2,870	2,572	5,846	8,060	4,778
23......	10,152	11,579	5,684	28,169	7,089	5,605	3,191	3,278	1,224	4,512	6,869	5,017
24......	12,321	9,382	4,923	26,183	6,071	11,089	4,188	3,078	2,912	5,869	8,348	4,533
25......	18,877	7,850	5,033	23,164	7,085	8,484	3,656	2,905	2,246	3,688	8,787	5,017
26......	17,752	14,141	4,893	20,499	8,541	7,150	2,975	2,501	2 805	4,690	7,411	3,653
27......	17,322	10,709	5,780	18,936	7,779	6,281	3,030	4,352	1,832	4,175	6,940	4,918
28......	15,638	6,937	19,765	16,472	26,263	5,455	2,728	4,343	2,294	1,582	5,783	4,005
29......	11,038	......	14,420	13,925	27,363	5,864	1,200	3,903	2,297	5,032	7,544	5,054
30......	8,934	......	13,371	13,218	20,242	4,784	3,604	3,856	1,157	4,577	6,723	3,396
31......	10,939	......	15,405	......	18,611	......	4,405	3,102	......	4,813	......	6,399
Mean..	8,750	6,605	9,025	19,530	13,060	8,289	5,080	3,080	2,310	3,133	4,993	4,542

Mean Daily Discharge, Second-feet, of Hudson River at Dam of Hudson River Electric Power Co., near Mechanicville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1.......	10,103	5,067	2,537	34,121	22,381	6,696	5,023	2,101	*1,404	8,698	14,606	*4,746
2.......	13,369	3,985	3,109	28,992	23,108	*6,434	5,829	3,152	1,292	9,253	12,725	7,500
3.......	10,331	*3,835	*844	24,545	21,626	7,170	5,495	3,118	1,281	9,130	*16,052	5,744
4.......	10,360	3,619	3,147	21,948	20,581	7,175	4,286	*1,819	1,849	6,644	18,859	5,779
5.......	9,838	4,393	2,504	18,431	*22,741	5,859	5,533	1,982	9,358	9,022	18,065	5,344
6.......	*9,211	3,615	2,537	18,512	20,693	6,809	7,558	2,322	10,742	*5,919	17,103	5,363
7.......	10,678	3,875	2,141	*16,482	21,878	6,896	*4,475	1,943	6,479	7,180	26,380	4,955
8.......	10,959	3,990	2,917	16,429	20,355	7,305	6,018	1,853	*4,305	8,322	29,736	*3,375
9.......	10,188	3,792	1,957	14,214	18,151	*5,181	4,521	2,058	5,315	10,280	28,782	4,396
10.......	8,884	*2,856	*1,446	14,171	17,283	7,196	2,998	2,379	4,912	12,624	*25,972	9,035
11.......	9,956	3,665	2,538	12,841	15,760	6,056	3,457	*1,020	4,759	14,322	27,483	22,922
12.......	7,708	3,749	2,900	12,700	*12,720	5,636	3,947	947	8,950	18,286	18,903	21,185
13.......	*5,657	3,239	3,124	13,462	13,890	4,879	3,270	2,320	5,053	*11,701	17,027	18,882
14.......	5,707	3,432	4,108	*11,585	11,974	5,405	*1,793	2,086	7,216	12,091	15,129	14,755
15.......	5,521	3,450	9,142	11,431	10,852	4,819	3,116	1,515	*6,024	7,996	13,629	*12,638
16.......	5,247	3,781	8,459	9,960	10,161	*2,981	2,621	1,302	5,817	7,003	11,306	12,574
17.......	5,837	*2,173	*10,053	11,046	12,951	6,360	2,685	1,262	4,768	6,322	*8,992	13,280
18.......	6,085	2,860	9,735	10,338	14,132	4,464	2,751	*1,163	4,161	6,170	9,876	11,023
19.......	6,065	3,658	8,756	8,990	*11,845	4,481	2,468	1,247	3,584	5,574	8,525	9,132
20.......	*8,392	3,019	7,895	8,329	10,841	2,519	3,015	1,701	2,355	*3,856	8,091	8,159
21.......	7,635	3,292	8,137	*5,697	8,682	2,962	*5,450	1,440	2,676	5,961	7,406	8,615
22.......	6,142	3,291	7,855	8,120	8,163	5,368	3,244	1,840	*1,053	5,274	8,117	*7,494
23.......	6,000	3,326	9,399	7,552	7,587	*3,312	3,013	1,732	3,834	5,297	8,165	8,642
24.......	5,481	*2,041	*12,156	9,282	7,451	4,202	2,626	1,362	5,077	5,028	*7,911	18,007
25.......	5,381	2,753	12,845	15,798	7,305	4,080	6,158	*1,290	4,745	5,193	8,100	20,173
26.......	4,801	2,729	14,758	16,724	*5,419	4,099	2,943	1,600	3,708	3,992	6,842	18,001
27.......	*4,118	3,256	15,922	23,919	7,079	4,306	3,663	2,100	4,726	*5,441	7,911	16,620
28.......	3,717	1,875	18,785	*22,237	7,859	3,453	*3,166	1,782	4,456	10,043	8,199	16,946
29	5,262	......	22,462	23,128	8,354	3,463	2,847	1,648	*5,223	24,231	6,693	*17,028
30.......	4,861	..	29,635	22,610	7,320	*4,258	2,801	1,607	9,374	22,847	6,590	16,228
31.......	4,309	......	*33,582	......	7,826	......	2,427	1,592	......	18,019	......	17,721
Mean..	7,348	3,380	8,883	15,786	13,451	5,127	3,845	1,783	4,817	9,410	14,106	11,815

* Sunday.

Mean Daily Discharge, Second-feet, of Hudson River at Dam of Hudson River Electric Power Co. near Mechanicville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
1......	17,225	3,820	*6,810	29,896	26,655	8,874	2,836	1,926	1,850	926	*1,368	......
2......	16,973	*3,137	6,501	26,882	27,733	7,167	2,205	*1,131	1,661	1,727	2,156	......
3......	14,980	4,120	7,303	25,805	*27,432	6,738	1,245	1,714	1,244	1,859	2,623	......
4......	12,845	4,150	9,732	21,547	28,237	6,139	889	2,169	1,254	*472	1,281	......
5......	*9,997	3,659	8,978	*18,512	24,514	5,557	*1,731	1,572	903	2,072	1,825	......
6......	13,790	4,417	6,867	18,358	22,712	4,408	2,682	1,592	*343	1,607	1,714	*355
7......	8,042	3,987	6,873	17,268	21,948	*4,059	3,408	2,322	911	1,368	1,718	3,063
8......	7,313	4,138	*6,566	18,892	23,580	5,334	2,425	2,597	1,210	1,819	*795	2,626
9......	8,286	*4,272	8,632	26,695	26,150	5,093	2,673	*1,377	1,089	1,717	1,739	2,512
10......	7,683	3,046	8,104	27,928	*24,301	4,485	2,445	3,042	1,582	1,285	1,598	2,512
11......	6,583	4,435	6,680	27,837	25,075	4,484	1,647	1,814	1,425	*715	1,607	2,279
12......	*6,073	3,294	8,510	*28,555	20,699	4,828	*1,853	1,941	1,077	1,284	1,613	2,270
13......	10,215	4,133	12,157	27,934	18,711	3,757	2,148	1,820	*945	712	1,731	*808
14......	8,946	4,507	18,956	25,684	18,473	*2,246	2,989	1,130	372	1,284	931	3,075
15......	7,270	14,813	*15,225	23,807	18,215	3,391	2,474	1,779	1,632	934	*686	2,597
16......	7,136	*23,945	17,517	23,458	17,434	6,557	1,602	*1,026	1,295	1,160	2,733	3,063
17......	6,404	16,706	14,043	21,556	*16,121	4,730	2,125	2,165	920	1,274	3,932	1,837
18......	6,538	16,142	12,317	20,099	16,443	3,838	1,926	2,382	1,276	*354	2,170	2,601
19......	*5,339	14,560	11,807	*20,583	12,966	4,195	*1,575	2,422	804	1,651	2,927	2,576
20......	5,987	13,281	11,332	21,091	13,582	3,911	1,893	2,566	*912	1,254	1,811	*1,142
21......	6,173	12,151	11,199	20,341	12,879	*1,820	2,642	1,454	672	1,276	1,705	2,159
22......	6,410	12,222	*9,983	19,221	11,684	2,776	3,068	1,840	685	920	*1,392	2,150
23......	6,004	*11,204	11,167	18,296	11,364	4,326	3,116	*1,723	350	1,253	2,156	1,683
24......	5,602	9,678	15,374	17,222	*13,929	4,430	2,554	1,448	929	1,260	2,692	1,796
25......	5,804	8,774	17,565	20,019	12,365	2,780	2,492	2,254	920	*819	2,238	1,848
26......	*4,531	7,678	15,473	*22,665	8,823	3,625	*2,982	2,239	1,268	1,290	1,815	1,483
27......	5,299	8,428	18,567	24,691	9,452	2,357	3,118	2,197	*811	1,708	1,815	*1,594
28......	5,382	11,629	23,293	27,800	8,239	*1,347	2,339	2,422	1,265	1,598	3,843	1,604
29......	5,709	8,815	*29,897	27,494	7,962	2,466	1,749	1,320	1,631	3,603	*1,693	1,714
30......	4,967	......	32,265	28,601	7,016	2,377	2,929	*1,970	1,271	2,248	4,053	1,606
31......	4,747	......	31,740	.....	*7,494	......	2,241	1,499	.....	2,660	......	2,158
Mean..	8,008	8,453	13,595	23,291	17,490	4,270	2,323	1,898	1,083	1,423	2,012	2,045

* Sunday.

Mean Daily Discharge, Second-feet, of Hudson River at Dam of Hudson River Electric Power Co., near Mechanicville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1......	1,717	6,139	19,050	15,369	21,607	7,380	3,190	*790	1,259	1,957	1,763	2,555
2......	1,613	5,564	15,987	14,410	*21,977	7,328	3,380	1,808	1,377	1,643	1,674	3,002
3......	*839	5,116	14,517	15,825	23,970	6,332	3,013	902	1,727	*1,977	1,656	2,548
4......	1,714	4,840	13,444	*15,818	25,351	6,566	*1,948	1,693	2,112	3,234	1,564	1,780
5......	2,641	4,603	11,799	18,448	25,001	5,719	1,911	2,139	*778	2,380	1,591	*1,341
6......	13,187	11,505	9,759	19,809	24,362	*5,822	3,960	905	1,651	2,300	1,681	2,658
7......	8,968	*10,384	*7,878	25,393	21,823	8,202	3,330	1,346	1,216	1,865	*1,024	2,876
8......	6,777	9,707	7,919	34,007	22,908	8,362	2,359	*342	1,513	1,591	1,712	3,409
9......	4,740	9,096	7,297	36,662	*23,626	7,461	2,950	1,712	1,666	1,574	1,714	2,665
10......	*8,020	7,583	6,638	33,759	22,741	7,259	2,744	2,053	1,728	*1,174	2,247	3,094
11......	8,780	9,216	10,850	*27,703	25,086	6,978	*1,884	1,718	1,920	1,890	1,576	2,953
12......	5,355	8,146	10,355	25,509	27,409	8,334	1,689	2,130	*1,256	1,450	2,044	*1,362
13......	5,320	8,744	6,000	22,750	31,138	*5,987	1,999	1,376	1,623	1,150	1,708	2,656
14......	4,004	*8,074	*7,760	27,752	24,547	7,867	2,103	1,248	1,497	1,463	*1,237	3,391
15......	4,075	8,559	8,743	40,668	22,266	7,460	1,658	*454	1,617	1,454	2,499	3,035
16......	2,993	9,350	8,519	46,458	*18,759	7,006	2,156	1,378	1,673	1,460	2,260	3,184
17......	*2,930	8,917	7,349	45,568	20,246	6,144	1,753	1,822	1,466	*899	1,420	2,905
18......	3,435	8,909	6,048	*41,041	19,260	6,471	*1,318	2,615	1,707	1,353	1,584	2,163
19......	3,400	7,875	6,233	37,339	19,203	7,093	897	3,030	*856	1,588	1,189	*1,047
20......	2,990	43,083	6,789	34,987	17,957	*7,246	1,767	2,938	1,614	1,801	1,538	2,982
21......	2,998	*28,341	*5,166	35,346	16,351	7,875	2,257	3,000	1,270	1,794	*1,309	2,611
22......	3,129	21,979	7,001	34,131	15,506	5,401	2,616	*912	1,172	1,755	2,231	2,516
23......	3,126	20,515	6,598	30,772	*14,984	5,352	2,540	2,758	1,491	1,327	2,616	2,588
24......	*4,011	20,913	6,517	29,086	13,621	4,960	2,163	2,440	2,020	*791	1,840	2,296
25......	11,886	30,890	9,122	*23,834	12,228	4,660	*1,259	2,074	1,690	1,124	1,672	919
26......	11,476	26,778	15,582	22,511	10,297	4,408	1,745	1,492	*743	1,232	1,585	*682
27......	10,868	21,056	13,537	21,789	9,138	*3,659	3,100	1,348	1,588	2,624	2,613	2,023
28......	10,575	*19,230	*14,373	20,041	8,587	4,523	2,116	1,236	1,117	2,151	*2,027	2,068
29......	8,957	....	16,194	21,137	8,238	4,620	2,331	*24	1,475	2,680	3,586	2,127
30......	9,837	....	15,129	19,419	*8,946	3,155	2,111	1,246	2,439	1,329	3,006	2,118
31......	*8,292	....	14,295	....	9,709	....	1,364	1,357	....	*1,609	....	2,031
Mean..	5,763	13,754	10,208	27,911	18,930	6,324	2,246	1,599	1,511	1,697	1,875	2,341

* Sunday.

Mean Daily Discharge, Second-feet, of Hudson River at Dam of Hudson River Electric Power Co., near Mechanicville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.......	1,720	5,791	32,846	35,309	*13,946	16,851	4,259	1,811	1,673	5,161	3,798	4,145
2.......	*910	4,532	32,393	35,739	12,845	16,857	4,543	2,239	1,600	*2,315	4,185	3,170
3.......	1,387	4,488	30,440	*34,342	13,604	14,768	*2,212	1,677	1,567	4,078	5,002	3,017
4.......	1,252	4,190	30,429	30,071	12,182	12,467	1,850	1,958	*924	3,468	4,574	*2,093
5.......	2,215	4,442	30,051	25,854	14,477	*10,423	3,354	2,656	2,134	2,964	4,286	3,102
6.......	2,119	*3,437	*26,976	23,629	13,916	13,743	2,879	3,218	2,986	2,555	*2,958	3,906
7.......	2,960	4,079	30,135	23,302	*12,343	17,789	2,202	*2,460	2,587	3,210	7,401	3,782
8.......	2,677	4,295	29,471	23,313	10,251	18,401	2,186	3,386	3,311	2,172	5,691	3,611
9.......	*1,793	4,096	25,132	22,969	12,096	17,813	2,187	3,058	3,070	*1,377	4,710	2,976
10.......	3,083	3,334	22,977	*19,039	11,043	16,829	*1,799	2,670	3,437	3,145	4,610	2,640
11.......	3,543	3,304	20,365	16,686	10,372	15,320	2,479	2,748	*1,788	3,171	4,951	*1,142
12.......	3,022	3,253	19,998	14,751	9,755	*16,033	1,702	2,120	4,224	3,165	3,837	1,811
13.......	3,079	*2,649	*18,262	14,190	8,579	15,891	2,105	2,452	2,903	2,560	*2,557	1,974
14.......	3,981	4,480	18,115	13,176	*7,667	14,998	1,736	*2,859	2,414	3,057	4,941	1,890
15.......	2,597	4,472	16,076	10,510	6,104	13,142	1,724	3,360	2,836	2,878	4,505	1,984
16.......	*2,101	4,258	14,012	10,097	8,015	11,741	1,579	2,903	3,135	*1,790	4,467	1,989
17.......	3,074	3,750	13,420	*9,485	6,910	11,059	*930	2,544	2,205	3,084	4,251	2,114
18.......	2,912	4,473	11,836	11,546	6,369	10,931	1,763	2,218	*474	2,518	4,167	*684
19.......	4,544	3,973	10,844	12,105	6,555	10,443	2,125	2,641	2,540	2,013	3,310	2,028
20.......	4,210	*2,178	*11,255	14,880	6,539	*11,275	1,826	2,530	2,722	2,355	*1,728	2,120
21.......	3,486	2,160	13,497	19,507	*6,728	9,265	1,619	*1,237	2,126	1,795	4,234	2,133
22.......	29,826	7,048	13,463	15,559	5,737	8,531	1,802	2,611	2,090	2,422	2,905	2,531
23.......	*17,037	6,522	14,716	13,285	9,449	7,757	1,589	2,517	2,003	*1,369	3,325	2,090
24.......	13,848	5,757	15,952	*14,474	8,247	6,953	*1,775	1,866	1,588	2,421	2,646	2,116
25.......	11,562	6,067	19,351	12,321	8,176	4,230	2,165	1,671	*1,132	3,639	3,702	*1,133
26.......	10,308	5,087	28,408	11,953	12,450	*2,310	1,400	1,548	1,982	2,847	3,849	2,639
27.......	9,991	*4,953	*29,586	16,321	15,639	5,756	2,242	2,119	1,902	3,202	*2,154	3,444
28.......	9,498	33,296	28,860	18,553	*15,076	6,055	1,588	*884	2,795	3,286	4,048	3,455
29.......	7,213	....	28,139	15,292	12,903	4,641	1,819	1,308	5,738	3,441	4,356	4,002
30.......	*8,548	....	30,849	12,753	13,316	3,888	1,694	1,146	7,190	*3,285	4,117	4,181
31.......	7,740	....	33,680	....	17,123	....	*929	*a*	....	4,950	....	4,838
Mean....	5,879	5,370	22,630	18,367	10,594	11,539	2,066	2,280	2,572	2,893	4,042	2,669

a No record. *** Sunday.**

Monthly Discharge of Hudson River at Dam of Hudson River Electric Power Co., near Mechanicville N. Y.

[Drainage area, 4,570 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1897.					
October	4,110	2,150	2,523	0.552	0.636
November	19,456	2,150	9,962	2.18	2.43
December	35,706	2,293	14,479	3.17	3.66
1898.					
January	13,757	4,689	7,703	1.69	1.95
February	13,042	4,151	6,757	1.48	1.54
March	36,736	3,938	18,844	4.12	4.75
April	25,100	7,400	13,653	2.99	3.34
May	16,230	7,200	11,089	2.43	2.80
June	10,128	3,100	5,296	1.16	1.29
July	4,542	1,055	2,781	0.609	0.702
August	6,188	2,077	4,079	0.893	1.03
September	7,952	2,191	4,363	0.955	1.07
October	24,538	1,907	8,685	1.90	2.19
November	21,456	4,339	10,625	2.32	2.59
December	9,967	3,311	5,591	1.22	1.41

Monthly Discharge of Hudson River at Dam of Hudson River Electric Power Co., near Mechanicville, N. Y.—(Continued).

[Drainage area, 4,570 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1899.					
January	11,495	4,025	7,099	1.55	1.79
February	14,028	2,035	4,300	0.94	0.980
March	22,130	7,016	10,302	2.25	2.59
April	39,943	8,406	25,335	5.54	6.18
May	29,017	3,686	10,806	2.36	2.72
June	4,493	330	2,325	0.509	0.568
July	3,834	232	1,973	0.432	0.498
August	1,479	213	1,154	0.253	0.292
September	7,162	211	1,963	0.429	0.479
October	4,776	206	2,220	0.486	0.560
November	13,178	2,086	5,912	1.29	1.44
December	15.502	2,891	7,166	1.57	1.81
1900.					
January	20,200	1,915	5,365	1.17	1.35
February	47,291	3,049	13,388	2.93	3.05
March	22,202	4,673	9,876	2.16	2.49
April	44,372	10,654	24,449	5.35	5.97
May	19,263	4,353	10,791	2.36	2.72
June	8,968	1,409	3,944	0.863	0.963
July	4,090	410	1,464	0.320	0.369
August	5,358	778	2,170	0.475	0.548
September	2,240	475	1,410	0.309	0.345
October	2,784	617	1,603	0.351	0.405
November	13,582	1,203	4,979	1.09	1.22
December	12,016	2,114	5,336	1.17	1.35
1901.					
January	4,600	1,592	2,760	0.604	0.696
February	2,636	1,166	1,801	0.394	0.410
March	23.206	1,442	8,739	1.91	2.20
April	53,947	14,553	29,217	6.39	7.13
May	22,325	9,863	13,668	2.99	3.45
June	16,342	4,677	9,647	2.11	2.35
July	4,706	1,575	2,865	0.627	0.723
August	6,667	2,135	4,423	0.968	1.12
September	5,253	2,682	3,806	0.833	0.929
October	7,657	2,455	4,168	0.912	1.05
November	5,147	2,331	3,568	0.781	0.871
December	34,329	2.024	8,689	1.90	2.19
1902.					
January	10,634	2,818	4,973	1.09	1.26
February	9,813	2,205	3,849	0.842	0.877
March	45,449	16,643	28,027	6.13	7.07
April	30,849	8,668	16,304	3.57	3.98
May	21,922	3,529	10,268	2.25	2.59
June	7,396	5,711	6,534	1.43	1.60
July	15,116	5,501	9,352	2.05	2.36
August	10,682	2,937	6,628	1.45	1.67
September	6.081	2,356	3,753	0.821	0.916
October	18,811	3,917	6,639	1.45	1.67
November	21,310	3,916	7,336	1.61	1.80
December	29,575	3,806	9,104	1.99	2.29
1903.					
January	12,378	4,678	7,257	1.59	1,83
February	16,631	6,594	9,736	2.13	2.22
March	49,737	13,174	30,273	6.62	7.63
April	24,943	5,567	15,273	3.34	3.73
May	13,669	742	4,398	0.962	1.11
June	20,438	2,299	9,755	2.14	2.39
July	10,718	3,250	5,636	1.23	1.42
August	10,576	4,113	6,292	1.38	1.59
September	10,597	2,052	4,644	1.02	1.14
October	24,815	755	9,505	2.08	2.31
November	6,009	504	4,911	1.07	1.19
December	12,450	2,380	4,771	1.04	1.20

Monthly Discharge of Hudson River at Dam of Hudson River Electric Power Co., near Mechanicville, N. Y.—(Continued).

[Drainage area, 4,570 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1904.					
January	7,001	2,226	3,825	0.837	0.963
February	10,994	2,973	4,887	1.0	1.15
March	23,047	4,130	10,490	2.30	2.65
April	38,210	12,651	21,443	4.69	5.23
May	29,784	5,330	14,315	3.13	3.61
June	25,531	2,797	7,252	1.59	1.77
July	5,235	718	3,464	0.758	0.872
August	9,033	1,953	3,993	0.874	1.01
September	9,845	2,182	4,786	1.05	1.17
October	31,678	3,092	11,527	2.52	2.90
November	8,703	2,031	5,282	1.16	1.29
December	21,698	510	3,798	0.831	0.956
1905.					
January	12,182	2,655	5,860	1.28	1.48
February	4,535	925	2,598	0.568	0.592
March	35,573	1,176	7,138	1.56	1.80
April	40,426	8,921	19,370	4.24	4.73
May	11,368	3,988	7,056	1.54	1.78
June	17,340	2,400	8,313	1.82	2.03
July	13,507	2,294	6,622	1.45	1.67
August	11,974	2,336	6,176	1.35	1.56
September	21,734	3,578	12,314	2.69	3.00
October	11,145	3,826	6,666	1.46	1.68
November	13,312	3,256	6,238	1.37	1.53
December	23,541	3,794	8,300	1.82	2.10
1906.					
January	18,877	2,596	8,275	1.81	2.09
February	14,141	3,279	6,665	1.46	1.52
March	26,067	3,640	9,021	1.97	2.27
April	37,178	9,694	18,492	4.05	4.52
May	27,363	6,071	13,051	2.86	3.30
June	15,042	5,455	8,289	1.81	2.02
July	12,861	776	5,117	1.12	1.29
August	4,352	345	3,060	0.670	0.772
September	3,850	1,157	2,310	0.505	0.563
October	5,869	454	3,110	0.681	0.785
November	8,787	1,796	5,049	1.10	1.23
December	6,399	2,528	4,575	1.00	1.15
1907.					
January	13,369	3,717	7,348	1.608	1.849
February	5,067	1,875	3,380	0.740	0.770
March	33,582	844	8,883	1.944	2.236
April	34,121	5,697	15,786	3.456	3.871
May	23,108	5,419	13,451	2.943	3.384
June	7,305	2,519	5,127	1.122	1.257
July	7,558	1,793	3,845	0.841	0.967
August	3,152	947	1,783	0.390	0.448
September	10,742	1,053	4,817	1.054	1.180
October	24,231	3,856	9,410	2.059	2.368
November	29,736	6,590	14,106	3.087	3.457
December	22,922	3,375	11,815	2.585	2.973
1908.					
January	17,225	4,531	8,088	1.77	2.04
February	23,945	3,046	8,453	1.85	2.00
March	32,265	6,501	13,595	2.97	3.42
April	29,896	17,222	23,291	5.10	5.71
May	28,237	7,016	17,490	3.82	4.39
June	8,874	1,347	4.270	0.934	1.05
July	3,408	889	2,323	0.508	0.584
August	3,042	1,026	1,898	0.415	0.477
September	1,850	343	1,083	0.237	0.265
October	3,603	354	1,423	0.311	0.358
November	4,053	686	2,012	0.440	0.493
December	3,075	355	2,043	0.447	0.514

Monthly Discharge of Hudson River at Dam of Hudson River Electric Power Co., near Mechanicville, N. Y.—(Concluded).
[Drainage area, 4,570 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1909.					
January	13,187	839	5,763	1.261	1.450
February	43,083	4,603	13,754	3.010	3.130
March	19,050	5,166	10,208	2.234	2.569
April	46,458	14,410	27,911	6.107	6.840
May	31,138	8,238	18,930	4.142	4.763
June	8,362	3,155	6,324	1.384	1.550
July	3,960	897	2,246	0.491	0.565
August	3,030	24	1,599	0.350	0.402
September	2,439	743	1,511	0.331	0.371
October	3,234	791	1,697	0.371	0.427
November	3,586	1,024	1,875	0.410	0.459
December	3,409	682	2,341	0.512	0.589
1910.					
January	29,826	910	5,879	1.286	1.479
February	33,296	2,160	5,370	1.175	1.222
March	33,680	10,844	22,630	4.952	5.695
April	35,739	9,485	18,367	4.019	4.501
May	17,123	5,737	10,594	2.318	2.666
June	18,401	2,310	11,539	2.524	2.827
July	4,543	929	2,066	0.452	0.520
August	3,386	884	2,280	0.499	0.574
September	7,190	474	2,572	0.563	0.631
October	5,161	1,369	2,893	0.633	0.728
November	7,401	1,728	4,042	0.884	0.990
December	4,838	684	2,669	0.584	0.672

Daily Precipitation, in Inches, at Hudson River Electric Power Co's Plant, near Mechanicville, N. Y

DAY.	Oct.	Nov.	Dec.
1905.			
1			
2			0.02
3			1.28
4		0.20	0.35
5			
6		0.35	
7		0.28	
8		0.08	
9			
10			0.08
11			
12		0.01	0.08
13			
14			
15			
16			
17		T	
18		T	
19	0.36		
20	0.14		
21	0.10		0.31
22	T		0.31
23	0.02		0.05
24			0.08
25			
26			
27			
28		0.04	
29			
30		0.47	0.10
31	0.03		T
Total		1.43	2.66

T means trace.
NOTE.—Rain gage not installed until Oct. 19, 1905.

Daily Precipitation, in Inches, at Hudson River Electric Power Co's Plant, near Mechanicville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1906.												
1		0.07					0.03					
2					0.89	0.56						
3	0.70			0.05		0.05	0.30		0.46			
4			1.45		T			0.15				
5		0.03		0.23	T	0.25						
6					T	0.26		0.10		0.05		0.40
7					0.04	0.05						0.38
8					0.11	1.31	T					
9		1.80		0.87	0.43	0.51	0.18			0.28		
10				0.40			0.28			0.18	0.18	
11	0.16		0.02					0.52		0.37	0.08	0.42
12	0.03				T						0.98	
13					T						0.18	
14				0.32								
15						0.41					0.37	
16	T					1.10						
17	T					T	0.12					
18						0.05						
19						T				1.40		
20	0.15		1.40			T		1.30	0.21	0.08		0.37
21		0.50		0.08		T	0.70	0.10	0.11		0.61	
22	T					0.05		0.25	1.11			
23						0.44	0.80					T
24	0.47				0.30					0.18		
25		0.35			0.04						0.05	
26					0.84			0.10	0.21		0.05	T
27					2.00			0.95	T	0.18		T
28			0.60		0.43	0.40	T			T		T
29						0.32	0.45		0.48	0.10		
30			0.12	0.15		1.27	T	0.03		0.18		0.30
31			0.25							0.10		0.78
Total	1.51	2.75	3.84	2.10	5.08	7.03	2.86	3.50	2.58	3.10	2.50	2.65

T means trace.

Daily Precipitation, in Inches, at Hudson River Electric Power Co's Plant, near Mechanicville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1							T	T	T			0.09
2	0.51	0.20	0.30			0.29		T	0.45		0.56	T
3					0.32	0.08	0.08	T	0.70	0.78		
4				0.10		0.06		T	4.25			
5		0.60				0.26		0.04	0.15			
6					0.09	0.06		0.04			1.68	
7					0.50				0.14	0.68	0.03	
8	0.34			1.30						T		
9						0.26						0.18
10		0.01			0.18				T		T	0.57
11					T		1.83		1.29			
12												
13			0.30									
14	0.15		0.27									
15					0.66							
16					0.26			0.20				0.37
17							0.93		T			
18									0.06			
19					0.05						T	
20							0.13	0.40	0.20	0.62	0.15	
21						0.09						T
22							0.37		0.35			
23				0.77				0.08	0.70			0.76
24			0.35				0.53				0.47	
25				0.09		0.27	T				0.02	
26				0.63		0.45					0.11	T
27			0.20		0.49					0.72	T	
28			0.15		0.30			0.21	0.92	1.20	T	
29						1.89	0.04					
30				0.23		0.08		0.08				
31					0.16		T					
Total	1.00	0.81	1.57	3.12	3.01	3.79	3.91	1.05	9.21	4.00	3.02	1.97

T means trace.

Daily Precipitation, in Inches, at Hudson River Electric Power Co's Plant, near Mechanicville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
1		0.60	0.10	0.06	T	0.06	0.22			0.37		
2			0.97	T	0.40		T		0.05			
3					T							
4					T			0.10				
5								0.18				
6		0.60			T							
7			0.49		1.15			0.55	0.05		T	0.82
8	0.40		T	0.82	0.23						0.20	T
9					0.02	0.36						T
10								T		0.47	0.02	
11	0.19			0.04				0.09				T
12	0.22			0.03			0.07					
13		0.10	0.13					0.05				
14		0.30			0.73		0.02				0.02	
15		0.36	0.09	0.25		0.80						
16	T										T	
17		T	0.03		T		0.15	0.65			T	0.03
18			0.18	0.22			1.09		T			T
19		0.60		T		T					0.32	
20		T		T	0.08							
21	T				0.36			0.44				
22					T		T	0.04				
23	T	0.01	0.27				0.08					
24						0.80	0.55					
25				0.09			0.06					
26		0.39			0.11					0.89		
27				0.48						0.10		
28			0.36	T					0.72	0.68		
29				T	0.36							
30				0.47	0.52		T				0.03	0.66
31					0.11							
Total	0.81	2.96	2.62	2.46	4.07	2.02	3.24	2.10	0.82	2.51	0.69	1.51

T means trace.

Daily Precipitation, in Inches, at Hudson River Electric Power Co's Plant, near Mechanicville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1					0.33					T		
2					0.05	T	0.60					
3				T	0.56						T	
4			0.40		T	T			0.21		T	
5	0.79	T	T			0.28	T	0.89				
6		0.20		0.17	0.08							
7			0.18		T						0.06	0.33
8											0.01	T
9				T								
10	T		T		1.35	0.52			1.11			T
11										0.31		
12		0.50	T					0.09				T
13	T				T	0.44						1.08
14				1.09		T				0.05		
15		T		T	0.32		0.61	0.35		T		
16	0.60				0.30		0.45	0.15	0.06	T	0.13	
17	0.40				0.22	1.22	0.07	0.61		T		T
18				T			0.30	T		T		
19		1.98		T								
20				T				0.41				
21				0.16						0.18		
22				T	0.15	0.01			T	T	0.09	
23	0.17	0.45		T		0.05			0.52	0.18		
24	0.66	0.60					0.85				0.25	
25			0.74				0.20				0.30	0.40
26			0.65	T				T				0.40
27	T			0.28	0.65				0.05			
28					0.09	0.96			1.55		0.28	
29				0.16	0.10			T	T			
30	0.30			0.24								
31							T	0.23	T			
Total	2.92	3.73	1.97	2.10	4.20	3.48	3.08	2.73	3.50	0.72	1.12	2.21

T means trace.

Daily Precipitation, in Inches, at Hudson River Electric Power Co's Plant, near Mechanicville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1			T		0.19	0.12		0.18	0.12			0.04
2											0.24	
3	0.30	0.99			0.46				0.63		0.63	T
4				0.17				0.75	0.12		0.33	
5						1.12		T			0.03	
6	0.93		0.46	0.73		0.54		T	0.53	0.12	T	
7	T			0.13			0.12		0.08	0.05		T
8				0.19	T				0.24	0.04	T	T
9	T				0.14	0.07		T.		0.10	0.29	
10	T				0.05	0.34		0.42			T	
11		1.10		0.26	T	0.22		0.37			T	T
12		0.30			T	0.05	0.03				0.03	T
13											T	
14	0.10								0.24		T	
15										T		0.03
16						0.25	0.35					
17		0.40			0.18	T						
18	0.10	0.20		0.45	0.31	T						0.13
19				0.03			0.19	0.13		T		T
20		0.30	0.12		0.38					0.16		0.03
21	0.69						0.04				T	
22		0.60					0 08			0 55	0.10	
23					T				T	T	0.03	0.61
24				0.15	0.18		0.03		0.35	T	0.06	0.15
25	0.40			0.91	0.68		0.65		0.14	0.16	0.07	T
26	T	0.20		0.03			T		T	0.08		0.02
27		0.40				0.08	0.30		0.71	0.05		
28	T	0.18								0.04	0.40	0.21
29	0.10			0.03	T					0.04	0.20	0.05
30	T				0.97		0.05			T	0.20	
31					0.07							
Total	2.62	4.67	0.78	3.08	3.61	2.79	1.84	1.85	3.16	1.39	2.61	1.27

T means trace.

HUDSON RIVER AT WEST VIRGINIA PULP AND PAPER CO.'S MILL, MECHANICVILLE, N. Y.

A record of the flow of Hudson river at Mechanicville has been kept at the Duncan dam since December, 1888. The record includes two daily readings of the depth on the crest of the dam, and a continuous record of the run of the water-wheels in the adjoining paper-mill. The accompanying tables, computed by Mr. R. P. Bloss, the engineer of the West Virginia Pulp and Paper Company, show the daily and monthly mean flow at Mechanicville.

The dam at Mechanicville was raised during 1904, a concrete crest and apron being added, so that the dam has now a rounded, or ogee cross-section. A discharge curve has been calculated, using coëfficients of discharge derived from United States Geological Survey experiments on models of dams of ogee cross-section.

Water carried in Champlain canal, which parallels Hudson river from Fort Edward to Albany, is not included in the estimated discharge.

Mean Daily Discharge, Second-feet, of Hudson River at West Virginia Pulp and Paper Co.'s Mill, Mechanicville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1.......	1,874	6,879	15,672	11,867	18,524	7,243	2,389	*1,404	1,379	1,778	1,935	1,868
2.......	1,589	5,690	12,458	11,485	*21,185	6,618	2,293	1,783	1,578	1,753	1,549	2,550
3.......	*1,836	4,790	12,654	12,216	21,493	5,598	2,327	1,010	1,736	*1,566	1,554	1,955
4.......	1,887	4,436	11,452	*13,758	22,566	5,362	*2,682	1,463	1,665	2,274	1,470	1,601
5.......	1,700	3,973	10,068	14,326	23,523	5,540	2,031	1,759	*674	1,501	1,472	*2,105
6.......	10,054	6,611	8,867	15,778	21,770	*6,894	2,941	1,245	1,187	1,906	1,551	1,764
7.......	10,269	*8,057	*8,017	20,423	19,817	9,564	2,401	1,213	2,140	1,711	*718	1,991
8.......	8,098	8,443	8,001	30,501	19,617	8,331	2,399	*612	1,473	1,677	1,561	2,172
9.......	6,566	7,471	6,740	34,880	*23,252	7,436	1,824	1,318	1,476	1,334	1,580	1,678
10.......	*7,084	6,652	6,465	31,515	18,708	7,016	......	1,115	1,476	*1,406	1,769	1,718
11.......	6,462	7,555	10,752	*28,234	21,082	6,509	*1,492	1,731	1,684	1,931	1,505	2,036
12.......	4,705	6,994	9,871	22,471	24,749	8,436	1,781	1,526	*1,501	1,697	1,594	*601
13.......	4,561	7,368	8,273	19,659	28,154	*6,801	1,785	933	1,524	950	1,585	1,675
14.......	3,823	*6,386	*8,167	20,410	22,696	7,747	1,764	1,077	1,548	1,516	*856	1,612
15.......	4,028	7,518	6,484	37,324	20,490	6,520	1,688	*740	1,579	1,503	2,357	1,664
16.......	1,968	8,147	7,573	46,299	*17,031	6,136	1,683	1,819	1,473	1,504	2,283	1,722
17.......	*3,506	7,445	7,490	44,847	17,511	5,126	1,859	1,769	1,515	*720	1,525	1,725
18.......	3,239	7,566	6,420	*40,771	17,104	5,814	*509	1,344	1,653	1,716	1,188	1,486
19.......	2,412	....	6,106	36,910	16,996	6,396	1,481	2,189	*430	1,453	1,195	*400
20.......	2,326	27,591	6,144	34,091	15,656	*8,109	1,481	3,209	1,482	2,001	1,402	1,815
21.......	2,347	*24,515	*6,293	37,736	14,777	7,093	2,109	2,704	1,482	1,806	*1,731	1,433
22.......	3,296	20,683	6,262	33,665	13,370	5,292	1,814	*1,032	883	1,496	1,955	1,520
23.......	1,995	18,376	5,641	29,977	*13,150	4,941	1,801	2,573	1,517	1,492	2,092	1,489
24.......	*6,328	16,719	7,013	27,855	10,039	4,075	1,935	2,146	1,697	*531	2,140	1,470
25.......	10,244	29,655	7,849	*	12,609	4,060	*1,712	1,807	1,738	1,589	1,652	873
26.......	9,634	22,897	13,483	21,187	9,469	3,748	1,809	1,717	*742	1,579	1,534	*557
27.......	9,421	19,865	12,488	19,146	8,373	*4,647	3,387	1,774	1,702	1,505	1,564	1,447
28.......	8,990	*16,346	*13,784	17,202	7,747	3,914	1,779	1,479	....	1,748	*2,014	1,473
29.......	8,155	....	14,215	18,917	7,231	3,270	1,752	*235	....	1,571	2,451	1,546
30.......	6,956	....	11,875	17,080	*8,784	2,496	1,206	1,027	....	1,448	2,617	1,412
31.......	*6,104	....	11,049	....	9,298	....	1,222	1,126	....	*1,549	....	1,424
Mean....	5,208	11,801	9,278	25,880	16,993	6,025	1,913	1,512	1,442	1,555	1,680	1,574

* Sunday.

Mean Daily Discharge, Second-feet, of Hudson River at West Virginia Pulp and Paper Co.'s Mill, Mechanicville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.......	1,533	5,570	31,537	35,906	*15,760	14,750	3,615	2,625	1,370	4,395	3,885	2,943
2.......	*1,331	4,247	30,930	36,054	11,459	14,665	3,588	1,562	1,238	*3,224	3,453	2,467
3.......	1,369	4,293	29,683	*37,809	11,422	12,967	*700	1,646	1,490	3,698	3,582	2,288
4.......	804	4,268	29,988	29,819	9,715	11,628	1,284	1,459	*809	2,880	3,667	*2,194
5.......	925	3,904	28,355	25,540	12,996	*8,173	2,979	2,333	1,488	2,274	4,059	2,499
6.......	1,745	*2,550	*25,211	23,072	12,485	14,025	2,640	2,402	2,658	2,314	*3,477	1,468
7.......	2,806	4,915	28,962	23,409	11,353	16,010	2,255	*2,435	2,807	2,281	6,071	2,130
8.......	2,163	3,814	29,088	23,808	*9,367	17,227	1,949	3,365	2,685	1,533	5,082	1,805
9.......	*1,982	3,345	24,586	23,659	11,015	16,959	1,792	2,355	2,899	*1,664	4,513	1,745
10.......	1,928	2,742	22,302	*17,722	9,227	15,728	*812	1,706	3,266	2,970	4,394	1,834
11.......	1,883	2,745	19,691	16,128	9,563	14,300	1,631	2,498	*3,400	3,557	3,692	*544
12.......	1,489	3,106	18,559	13,510	8,527	*14,028	1,421	1,748	3,500	2,027	3,598	1,552
13.......	1,528	*3,170	*15,818	14,426	7,355	14,848	1,464	2,993	2,134	2,896	*2,310	1,240
14.......	1,864	5,765	17,295	12,555	6,176	12,791	1,463	*2,658	2,393	2,692	4,403	1,260
15.......	1,866	3,344	14,250	9,997	*4,534	11,450	1,430	2,758	2,717	2,702	3,202	1,468
16.......	*2,134	3,858	12,778	9,429	7,166	9,759	1,385	2,061	2,701	*1,378	2,570	1,448
17.......	1,433	3,156	11,774	*8,469	5,696	8,896	*800	2,097	2,075	2,725	2,919	1,780
18.......	1,720	4,032	10,603	8,014	5,222	9,046	1,595	2,165	*345	2,388	3,013	*1,129
19.......	2,638	3,381	9,193	8,830	5,008	*8,827	1,394	2,555	2,080	1,765	2,130	1,466
20.......	4,583	*2,483	*9,684	13,813	4,795	9,760	1,328	2,527	1,766	1,926	*1,180	1,780
21.......	2,733	3,577	12,197	18,413	5,345	7,546	1,332	*796	1,604	1,242	2,533	1,376
22.......	31,151	5,528	12,314	14,457	*5,450	6,761	1,412	1,874	1,595	1,542	2,370	1,725
23.......	*15,692	6,002	12,622	12,270	7,341	6,078	1,465	2,389	1,429	*900	2,159	1,432
24.......	12,370	5,227	14,714	*12,885	6,312	5,425	*530	1,488	1,541	1,846	2,523	1,492
25.......	11,513	5,276	16,946	11,827	6,681	4,872	1,382	1,185	*1,036	3,548	2,098	*764
26.......	11,644	4,694	27,319	10,360	9,397	*3,283	1,395	1,629	1,987	2,800	4,771	3,234
27.......	8,514	*10,742	*28,173	16,735	13,668	5,064	1,473	2,212	1,537	2,584	*2,131	2,555
28.......	8,295	37,655	28,924	16,363	13,964	3,825	1,406	*867	2,744	3,335	2,709	3,191
29.......	7,358	....	27,375	13,283	*11,823	3,539	1,701	867	4,737	2,471	3,712	3,791
30.......	*6,822	....	29,529	11,221	12,297	3,064	1,410	1,180	6,143	*3,152	2,069	3,746
31.......	7,135	....	33,162	....	14,981	....	*717	1,243	....	4,289	....	3,601
Mean....	5,192	5,478	21,405	17,643	9,229	10,176	1,605	1,993	2,272	2,542	3,280	2,005

* Sunday.

Monthly Discharge of Hudson River at West Virginia Pulp and Paper Co's Mill, Mechanicville, N. Y.

[Drainage area, 4,500 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on area.
1909.					
January	10,269	1,700	5,208	1.157	1.331
February	29,655	3,973	11,801	2.622	2.727
March	15,672	5,641	9,278	2.062	2.371
April	46,299	11,485	25,880	5.793	6.443
May	28,154	7,231	16,993	3.776	4.342
June	9,564	2,496	6,025	1.339	1.500
July	3,387	569	1,913	0.425	0.489
August	3,209	235	1,512	0.336	0.386
September	2,140	430	1,442	0.320	0.358
October	2,274	531	1,555	0.345	0.397
November	2,617	718	1,680	0.373	0.418
December	2,550	400	1,574	0.350	0.402
1910.					
January	31,151	804	5,192	1.154	1.327
February	37,655	2,483	5,478	1.217	1.266
March	33,162	9,193	21,405	4.756	5.469
April	37,809	8,104	17,643	3.921	4.392
May	15,760	4,534	9,229	2.051	2.359
June	17,227	3,064	10,176	2.261	2.532
July	3,615	530	1,605	0.357	0.411
August	3,365	796	1,993	0.443	0.509
September	6,143	345	2,272	0.505	0.566
October	4,395	900	2,542	0.565	0.650
November	6,071	1,180	3,280	0.729	0.816
December	3,791	544	2,005	0.446	0.513

HUDSON RIVER AT CROCKER'S REEF DAM.

A gage was established above Crocker's Reef 450 feet up-stream from the head of Thompson's Island April 11, 1904, by J. A. O'Connor, for this Department. The reef has since been submerged by construction of a dam for the Barge canal. The gage is a painted scale subdivided to tenths of a foot from zero to 18 feet and is attached to the down-stream side of a large elm tree. The gage zero is at elevation 115.06. The regular observer is John H. Donnelly, Jr.

Crocker's Reef dam crosses the Hudson river at the upper end of Thompson island about six miles below Fort Edward. This dam, which was constructed in connection with the New York Barge canal, is of concrete masonry and has an ogee cross-section. The crest is at elevation 119.00, Barge canal datum, and was trowelled down to a uniform level during construction. This was done with care and accuracy, to provide for the use of the dam as a gaging weir. The dam was completed August 27, 1907. A record of the stage of the stream at a distance of about 1,200 feet up-stream has been maintained since April 11, 1904. The mean daily elevations for the years 1904 to 1908, inclusive, are contained in the State Engineer's report for 1908, pages 641-644. Computations of discharge have been made, beginning September 1, 1907.

The entire flow of the Hudson river passes over this dam, excepting what is carried past the dam in the present Champlain canal. The accompanying tables show the flow of the river proper, not including the flow in Champlain canal. The results of gagings to determine the flow in Champlain canal are also given. The discharge over the dam has been computed, using a variable coëfficient, the coëfficient used being 3.09 for low stages of the stream, but increasing as depth on crest increases. It is assumed that the natural slope in the channel from the gage down to the dam is approximately equal to the head due to velocity of approach and that the two elements counterbalance, no separate correction for velocity of approach being made.

At higher stages of the stream the Crocker's Reef dam becomes submerged and the discharge is less than for an unsubmerged weir with the same depth on the crest. The flow for higher stages has been reduced to take into account the effect of submergence.

Mean Daily Discharge, Second-feet, of Hudson River at Crocker's Reef Dam.

DAY.	Sept.	Oct.	Nov.	Dec.
1907.				
1	*575	4,482	8,100	*1,875
2	575	5,225	6,879	3,350
3	1,250	4,950	*7,479	3,350
4	1,400	4,236	12,600	3,350
5	3,150	3,990	12,600	2,950
6	3,990	*3,550	12,225	2,199
7	3,550	4,236	17,200	1,250
8	*2,750	5,225	22,775	*2,348
9	3,550	8,700	21,322	3,150
10	2,950	10,732	*18,358	3,350
11	2,950	10,032	16,050	11,100
12	3,350	9,350	13,724	12,975
13	2,950	*6,879	11,100	10,732
14	4,236	7,800	9,350	10,032
15	*3,350	6,325	8,100	*9,000
16	3,550	5,500	6,600	8,100
17	3,350	4,716	*4,236	7,479
18	2,950	4,716	4,482	6,325
19	1,875	3,990	4,236	5,225
20	2,050	*3,350	3,770	6,050
21	1,550	4,482	3,350	4,236
22	*1,700	3,770	3,350	*3,550
23	1,100	3,550	3,550	5,775
24	1,550	2,750	*3,150	8,700
25	1,550	2,199	4,236	11,475
26	1,550	1,875	3,550	11,100
27	2,750	*2,050	3,350	9,350
28	2,950	4,950	3,350	9,700
29	*2,348	12,225	3,350	*9,000
30	2,348	10,732	2,549	10,364
31	......	9,700	......	11,475
Mean	2,458	5,686	8,499	6,739

* Sunday.

Mean Daily Discharge, Second-feet, of Hudson River at Crocker's Reef Dam.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
1	10,732	2,199	*4,236	21,645	25,058	4,950	1,550	1,100	702	965	*1,250	1,700
2	10,732	*2,050	3,990	21,000	27,300	4,716	965	*1,100	468	965	1,250	1,875
3	10,032	2,549	3,550	17,608	*27,700	4,716	965	1,550	468	965	1,100	1,700
4	8,700	2,549	3,990	14,499	24,275	4,236	1,250	1,250	468	*1,250	965	1,400
5	*6,879	2,950	3,770	*11,850	21,645	3,350	*830	1,100	468	965	1,250	1,400
6	5,500	2,950	3,770	11,475	18,015	2,950	1,700	1,100	*468	1,100	1,100	*702
7	4,716	2,950	3,770	11,850	16,825	*2,199	1,550	1,250	468	1,250	1,100	1,400
8	4,236	2,950	*3,770	13,724	17,608	2,549	1,700	1,100	702	965	*1,100	1,550
9	4,236	*2,050	3,990	20,200	19,075	1,875	1,700	*830	830	965	702	1,550
10	4,482	2,750	3,770	20,600	*18,015	2,050	1,550	830	965	830	702	1,100
11	3,550	2,950	3,770	21,322	17,608	1,875	1,550	1,250	965	*360	830	1,550
12	*3,150	3,350	3,990	*22,022	14,900	2,050	*468	965	702	468	965	1,550
13	3,770	3,150	4,950	21,000	14,499	1,550	1,700	1,100	*575	702	965	*702
14	3,770	3,350	6,600	19,075	14,900	*1,100	1,400	1,250	702	575	830	1,550
15	3,550	4,950	*7,800	17,608	14,900	2,050	1,400	1,250	468	965	*702	1,700
16	3,350	*11,475	9,350	16,050	13,724	2,199	1,400	*965	468	965	1,875	1,700
17	3,350	11,475	9,350	14,900	*12,600	1,875	1,400	1,100	468	830	1,700	1,250
18	3,550	11,850	8,100	13,724	11,100	1,875	1,550	1,100	468	*702	1,550	1,700
19	*2,750	11,850	8,100	*12,975	8,700	1,700	*702	1,100	702	830	1,250	1,400
20	2,950	10,304	7,479	14,499	9,000	1,550	1,100	1,100	*702	965	1,250	*1,550
21	3,350	10,032	7,158	12,975	8,100	*702	2,348	1,100	702	830	1,400	1,250
22	3,350	8,700	*6,600	11,850	8,100	2,199	1,700	965	830	702	*702	1,400
23	3,350	*7,158	8,400	10,732	8,100	1,875	1,700	*830	702	830	1,250	1,400
24	3,550	6,600	9,000	11,475	*9,000	1,875	1,550	965	702	965	1,550	1,400
25	3,150	6,325	11,100	14,098	7,479	1,875	1,550	1,100	702	*965	1,550	1,250
26	*2,950	5,500	11,109	*16,825	6,325	1,550	*1,875	1,100	702	702	1,250	1,250
27	3,150	4,716	11,100	22,022	6,050	1,550	2,050	1,100	*468	965	1,100	*1,100
28	3,350	4,716	14,900	25,465	5,225	*702	830	1,100	575	830	2,199	830
29	3,350	4,236	*21,322	26,900	4,716	1,400	1,100	1,400	702	2,050	*1,550	1,100
30	2,750	......	21,000	25,832	4,236	1,700	1,250	*965	702	1,700	2,750	1,100
31	2,199	......	21,000	......	*4,236	......	1,100	702	......	1,550	......	1,400
Mean	4,467	5,668	8,090	17,193	13,517	2,228	1,403	1,088	634	957	1,231	1,371

* Sunday.

Mean Daily Discharge, Second-feet, of Hudson River at Crocker's Reef Dam.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1	1,100	4,236	11,850	6,050	14,900	4,236	1,875	*1,550	1,250	965	830	1,250
2	965	3,770	10,364	6,879	*76,050	3,990	1,875	702	965	830	965	1,400
3	*965	3,350	9,000	7,800	17,200	3,770	1,700	965	830	*702	702	1,100
4	965	2,950	8,100	*8,400	17,200	3,350	*1,400	1,100	575	1,100	830	1,550
5	1,550	2,950	6,879	10,032	16,450	3,990	1,400	1,100	*702	1,250	1,250	*575
6	2,050	2,950	5,775	12,600	16,450	*4,482	1,700	965	965	965	830	1,700
7	4,236	*3,550	*5,225	18,358	14,499	5,225	1,550	965	1,400	702	*1,100	1,700
8	4,482	4,950	5,225	25,058	16,050	5,775	1,550	*965	965	830	575	1,100
9	4,236	5,225	4,716	27,300	*17,608	4,950	1,550	702	575	830	1,250	1,250
10	*3,350	4,950	4,236	25,058	14,900	4,482	1,550	1,250	702	*575	830	1,550
11	3,990	4,950	4,236	*21,645	18,700	4,482	*1,250	965	1,250	702	830	830
12	3,770	4,950	4,182	18,015	22,022	5,500	1,250	702	*1,100	830	965	*360
13	2,549	4,950	4,482	15,650	22,400	*4,716	1,550	965	830	702	1,400	965
14	2,549	*4,236	*4,236	20,200	18,015	4,482	1,250	965	1,400	965	*830	1,250
15	2,050	4,482	4,236	31,950	17,200	4,482	830	*702	1,100	965	1,400	830
16	2,050	4,482	3,990	37,084	*11,850	4,482	965	830	1,100	702	702	702
17	*1,700	4,950	3,990	35,125	12,975	4,236	965	1,550	1,100	*1,100	468	575
18	2,050	5,225	3,550	*31,950	12,975	3,770	*702	1,875	1,250	1,250	1,100	1,100
19	1,875	4,716	3,350	28,772	13,724	4,236	702	1,875	*830	830	1,100	*280
20	1,875	8,100	3,350	27,700	12,600	*4,950	965	1,875	1,250	965	1,700	830
21	1,875	*12,600	*3,350	28,050	11,000	4,482	1,400	1,700	965	965	*965	468
22	1,700	12,600	3,550	26,550	10,732	3,770	1,550	*280	1,250	830	830	1,250
23	1,875	12,225	3,770	23,150	*10,364	2,950	1,550	1,550	1,250	575	830	1,250
24	*1,550	14,098	3,990	21,322	9,000	2,750	1,875	1,250	1,100	*965	575	965
25	1,875	15,650	5,500	*18,015	7,800	2,950	*1,875	965	702	965	1,400	468
26	5,775	14,098	8,100	16,450	7,479	2,950	965	1,100	*702	1,700	575	*280
27	6,600	12,975	6,879	16,450	6,050	*2,750	1,100	1,400	702	1,700	1,700	1,400
28	6,325	*12,600	*7,158	14,449	4,950	2,199	1,400	702	830	1,100	*1,100	1,250
29	5,775	....	6,879	14,098	4,482	1,875	1,100	*575	830	1,550	1,700	1,250
30	5,500	....	6,325	12,600	*5,225	1,875	965	965	830	1,250	2,050	1,250
31	*4,716	....	5,775	....	5,500	.....	965	575	.....	*1,250		1,250
Mean	2,965	7,027	5,566	20,227	1,311	3,938	1,333	1,085	977	987	1,046	1,032

* Sunday.

Mean Daily Discharge, Second-feet, of Hudson River at Crocker's Reef Dam.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	1,400	2,750	11,475	29,548	*10,364	10,732	3,990	1,250	830	3,770	2,750	2,050
2	*468	2,549	17,608	28,772	8,400	10,364	1,700	1,100	830	*2,549	2,549	1,400
3	965	2,199	19,825	*26,900	8,700	9,000	*1,550	1,250	1,250	2,549	2,549	1,875
4	360	2,199	21,000	22,775	8,400	7,479	1,400	1,400	*1,875	1,400	2,750	*965
5	1,250	2,348	19,925	17,200	10,732	*6,325	965	1,700	1,100	1,700	2,950	702
6	1,700	*2,199	*17,608	18,015	10,032	8,100	965	2,050	1,550	1,700	*3,350	2,050
7	1,400	2,050	16,825	16,825	9,000	12,225	965	*2,050	2,050	965	3,990	1,875
8	965	2,050	17,200	16,050	*7,800	12,975	1,100	1,700	2,050	1,550	3,770	1,400
9	*468	2,199	16,050	16,450	8,100	12,600	1,100	1,100	2,348	*1,700	3,550	1,400
10	1,250	2,050	14,098	*12,225	8,100	11,475	*702	1,400	2,199	1,700	2,950	965
11	702	1,700	12,600	10,732	6,879	10,732	468	1,550	*1,875	2,050	2,549	*575
12	965	1,875	11,850	9,000	6,050	*10,032	360	1,550	2,050	1,550	2,750	468
13	1,250	*1,550	*10,732	9,350	5,225	9,700	280	2,199	1,250	2,050	*2,348	360
14	1,250	2,348	10,032	8,400	4,236	9,000	360	*2,348	1,250	1,700	2,549	965
15	1,400	1,550	9,000	6,600	*4,236	8,100	575	1,700	1,875	1,550	2,199	1,250
16	*468	1,700	8,100	6,325	4,236	6,879	468	1,700	2,050	*1,875	1,700	1,400
17	965	1,875	7,479	*5,775	3,770	6,325	*575	1,100	1,875	1,700	2,199	1,250
18	1,250	1,875	6,325	4,482	3,350	6,325	1,100	1,400	*1,250	1,700	2,050	*965
19	1,875	1,875	5,775	8,700	3,350	*6,325	965	1,700	830	1,550	2,050	1,400
20	575	*1,700	*5,775	11,475	3,350	6,050	965	1,400	1,250	1,400	*1,400	1,400
21	702	1,700	6,050	14,900	3,550	5,225	830	*1,100	1,550	1,250	1,250	1,250
22	575	2,050	7,158	11,475	*3,990	4,716	1,250	965	1,250	1,875	1,875	1,250
23	*468	2,199	8,700	10,032	4,482	3,970	965	965	1,250	*1,250	1,700	1,400
24	6,600	2,050	10,364	*10,364	4,716	2,549	*702	1,100	1,250	1,100	1,700	1,400
25	6,600	2,050	13,724	8,700	5,225	2,348	830	830	*702	2,199	965	*702
26	6,325	2,050	21,000	8,400	9,700	*2,050	830	830	702	1,700	2,050	2,050
27	5,225	*2,199	*21,645	10,364	11,850	1,875	830	1,550	1,400	1,875	*965	1,550
28	4,950	4,236	21,322	12,600	11,475	1,875	830	*965	3,150	1,875	1,100	1,250
29	4,236	......	22,022	11,100	*10,032	1,875	575	702	4,950	1,875	2,050	1,400
30	*3,550	......	23,900	8,400	9,700	1,875	830	702	4,482	*2,950	1,550	1,550
31	3,550	......	27,300	......	10,364	......	*830	702	......	2,950	......	1,700
Mean	2,055	2,113	14,270	13,064	7,077	6,971	963	1,357	1,744	1,858	2,272	1,297

* Sunday.

Monthly Discharge of Hudson River at Crocker's Reef Dam.

[Drainage area, 2,959 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1907.					
September	4,236	575	2,458	0.831	0.927
October	12,225	1,875	5,686	1.92	2.21
November	22,775	2,549	8,499	2.87	3.20
December	12,975	1,250	6,739	2.28	2.63
1908.					
January	10,732	2,199	4,467	1.51	1.74
February	11, 50	2,050	5,668	1.92	2.00
March	21,322	3,550	8,090	2.73	3.15
April	26,900	10,732	17,193	5.81	6.48
May	27,700	4,236	13,517	4.57	5.27
June	4,950	702	2,228	0.753	0.840
July	2,348	468	1,403	0.474	0.546
August	1,550	702	1,088	0.368	0.424
September	965	468	634	0.214	0.239
October	2,050	360	957	0.323	0.372
November	2,750	702	1,231	0.416	0.464
December	1,875	702	1,371	0.463	0.534

Monthly Discharge of Hudson River at Crocker's Reef Dam—(Continued).
[Drainage area, 2,959 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1909.					
January	6,600	965	2,965	1.00	1.15
February	15,650	2,950	7,027	2.37	2.47
March	11,850	3,350	5,566	1.88	2.17
April	37,084	6,050	20,227	6.83	7.62
May	22,400	4,482	13,111	4.43	5.11
June	5,775	1,875	3,938	1.33	1.48
July	1,875	702	1,333	0.450	0.519
August	1,875	280	1,085	0.367	0.423
September	1,400	575	977	0.330	0.368
October	1,700	575	987	0.334	0.385
November	2,050	468	1,046	0.353	0.394
December	1,700	280	1,032	0.349	0.402
1910.					
January	6,600	360	2,055	0.694	0.800
February	4,236	1,550	2,113	0.714	0.744
March	27,300	5,775	14,270	4.82	5.56
April	29,548	4,482	13,064	4.41	4.92
May	11,850	3,350	7,077	2.39	2.76
June	12,975	1,875	6,971	2.36	2.63
July	3,990	280	963	0.325	0.375
August	2,348	702	1,357	0.459	0.529
September	4,950	702	1,744	0.589	0.657
October	3,770	965	1,858	0.628	0.724
November	3,990	965	2,272	0.768	0.857
December	2,050	360	1,297	0.438	0.505

HUDSON RIVER AT FORT EDWARD DAM.

This station, which is located at the dam of the International Paper Company, was established by Geo. W. Rafter in 1895, in connection with Upper Hudson storage surveys. Since 1899 this station has been maintained by the U. S. Geological Survey and by this Department. The dam is of framed timber on slate rock foundation, and has but little leakage. The crest is straight, very nearly level, and 587.6 feet in length. Flash-boards are usually maintained on the dam from 15 inches to 18 inches in height. A record is kept of the height of flash-boards, and of the times of their setting and removal.

There are 62 water-wheels in the adjoining mill. These are nearly all of modern types which have been tested at the Holyoke flume. A record is kept of the daily run of each in hours, as well as of the working head, which is usually 18 feet. The discharge through the turbines is taken from diagrams expressing the flow as a function of the working head and number of wheel-hours run.

In the winter of 1896–1897, a flood spillway was cut around the south end of the dam, over which the water begins to flow whenever it reaches the level of the crest of the flash-boards. The profile of the spillway is very irregular and causes some uncertainty in the calculated flow during times of high water.

Whenever the flash-boards are off from the main dam, the flow is computed by means of coëfficients derived from the United States Geological Station experiments on a model dam of similar cross-section.

With the flash-boards on, the flow has been computed from Francis' well-known formula for the thin-edged weir. During the dry season, but little water passes over the dam, the entire flow being employed to drive the turbines.

The drainage area tributary to the Hudson above Fort Edward is 0.62 of that of the same stream above Mechanicville gaging station. The principal intervening tributaries are the Hoosic river and Batten kill.

During the navigation season water is diverted from the Hudson river for the supply of the Champlain canal at Glens Falls feeder dam, seven miles up-stream from Fort Edward, and also at the Northumberland dam.

Mean Daily Discharge, Second-feet, of Hudson River at International Paper Co.'s Dam, Fort Edward, N. Y.

DAY.	Jan.	Feb.	Mar.	April	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	1,510	3,718	6,181	16,752	9,737	8,279	2,566	2,081	1,925	4,017	3,568	1,915
2......	684	3,045	9,854	16,179	9,760	8,279	2,340	1,348	1,830	2,045	3,495	1.721
3......	1,076	3,384	11,461	12,288	9,892	7,311	684	1,651	2,353	3,403	3,222	2,427
4......	1,021	2,992	11,493	12,284	10,867	5,643	1,458	2,459	1,550	2,590	3,136	895
5......	1,636	2,659	10,901	9,669	11,106	3,309	2,270	2,899	684	2,695	3,740	1,348
6......	1,929	2,560	10,036	8,480	10,867	6,965	2,030	2,618	3,400	2,196	2,204	2,479
7......	1,496	3,050	9,338	18,368	10,735	9,786	2,057	2,016	2,780	2,089	4,911	1,909
8......	1,215	2,532	9,552	18,368	8,253	10,136	2,072	3,115	3,199	2,548	4,612	1,666
9......	684	2,590	8,797	17,783	9,642	9,289	2,013	2,323	3,124	1,399	4,137	1,348
10......	1,327	2,465	6,346	10,520	9,642	9,870	852	2,481	3,127	3,161	3,421	3,348
11......	684	2,664	4,513	12,288	8,122	8,568	1,348	1,714	1,945	2,583	3,127	684
12......	1,315	2,783	4,247	11,398	6,662	6,797	1,348	2,870	2,565	2,890	3,214	684
13......	1,535	1,944	3,705	11,117	5,280	8,904	1,348	4,152	2,691	2,562	2,217	1,083
14......	1,465	2,850	3,269	9,094	5,099	7,487	1,348	2,246	2,623	2,715	3,491	1,252
15......	1,740	2,487	5,051	8,255	4,284	6,173	1,559	2,653	2,654	2,715	2,748	1,632
16......	797	2,452	3,178	6,831	6,702	5,636	1,713	2,484	1,873	1,258	2,483	1,896
17......	1,271	2,715	3,397	2,280	4,705	5,636	684	2,522	1,737	2,167	2,395	1,599
18......	1,608	2,600	2,438	6,032	4,435	7,311	1,740	2,069	1,114	2,289	2,475	1,155
19......	1,496	2,546	2,501	6,972	4,706	4,521	1,823	2,202	2,095	2,228	1,951	1,837
20......	684	1,515	684	15,645	6,204	5,874	1,348	2,522	1,592	1,953	1,021	1,801
21......	684	2,830	3,142	11,833	9,442	4,914	1,348	1,591	1,805	2,243	2,111	1,875
22......	3,108	2,350	3,415	12,280	11,618	4,344	1,805	3,046	1,797	2,610	1,946	1,555
23......	4,404	2,731	2,714	10,716	11,600	4,841	1,559	1,979	1,576	1,031	2,182	1,661
24......	6,531	2,762	3,474	10,954	10,442	4,257	684	1,932	2,032	3,050	1,484	1,744
25......	6,146	2,856	9,175	7,971	12,666	3,839	1,691	1,914	1,069	2,956	2,213	684
26......	6,593	2,762	13,408	10,351	17,205	2,248	1,628	2,051	2,070	2,851	2,378	2,412
27......	5,947	2,978	8,334	10,766	19,894	2,748	1,559	1,801	1,502	2,989	1,447	2,125
28......	5,203	3,534	11,981	11,560	19,674	3,128	1,524	1,035	2,417	2,804	2,975	2,292
29......	4,856	......	11,929	9,704	17,058	2,610	1,530	1,692	5,793	3,555	1,944	2,133
30......	4,676	......	14,296	12,431	16,703	2,895	1,617	2,138	5,018	2,595	2,417	2,167
31......	4,593	......	15,198	......	9,892		750	1,665	......	4,160	......	2.486
Mean...	2,513	2,727	7,226	11,306	10,097	6,053	1,559	2,234	2,334	2,592	2,757	1,671

Monthly Discharge of Hudson River at International Paper Co.'s Dam, Fort Edward, N. Y.

[Drainage area, 2,800 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
January	6,593	684	2,513	0.898	1.035
February	3,718	1,515	2,727	0.974	1.014
March	15,198	684	7,226	2.581	2.975
April	18,368	2,280	11,306	4.038	4.505
May	19,894	4,284	10,097	3.606	4.157
June	10,136	2,248	6,053	2.162	2.412
July	2,566	684	1,559	0.557	0.642
August	4,152	1,035	2,234	0.798	0.920
September	5,793	684	2,334	0.834	0.930
October	4,160	1,031	2,592	0.926	1.068
November	4,911	1,021	2,757	0.985	1.099
December	2,486	684	1,671	0.597	0.688

Current-meter Discharge Measurements of Champlain Canal Feeder at Hudson Falls, N. Y.

DATE.	Hydrographer.	REFERENCE POINT READING.			Meter No.	Lateral interval.	Submergence depth.	Area flowing.	Total width.	Computed discharge.
		Beginning.	Ending.	Mean.						
1910.						*Feet.*		*Square feet.*	*Feet.*	*Second-feet.*
May 31	A. R. Patchke	6.35	6.37	6.36	462	5	0.6	229	46	179
May 31	A. R. Patchke	6.30	6.30	6.30	462	5	0.6	231	46	169
Sept. 2	R. N. Barrett	6.70	6.70	6.70	462	5	0.6	209	46	171
Sept. 15	R. N. Barrett	6.60	6.60	6.60	462	5	0.6	233	46	167
Sept. 16	R. N. Barrett	6.60	6.60	6.60	462	5	0.6	221	46	172
Sept. 29	R. N. Barrett	6.53	6.53	6.53	462	5	0.6	220	46	190

Current-meter Discharge Measurements of Champlain Canal Feeder at Glens Falls, N. Y.

DATE.	Hydrographer.	REFERENCE POINT READING.			Meter No.	Lateral interval.	Submergence depth.	Area flowing.	Total width.	Computed discharge.
		Beginning.	Ending.	Mean.						
1910.						*Feet.*		*Square feet.*	*Feet.*	*Second-feet.*
May 31	A. R. Patchke	4.65	4.65	4.65	462	5	0.6	240	42.5	194
May 31	A. R. Patchke	4.60	4.61	4.60	462	5	0.6	243	42.5	199
Sept. 2	R. N. Barrett	3.90	3.90	3.90	462	5	0.6	269	42.2	179
Sept. 15	R. N. Barrett	3.90	3.90	3.90	462	5	0.6	270	42.2	182
Sept. 15	R. N. Barrett	3.90	3.90	3.90	462	5	0.6	270	42.2	192
Sept. 29	R. N. Barrett	4.00	4.00	4.00	462	5	0.6	271	42.2	216

HUDSON RIVER AT CORINTH, N. Y.

A gaging station was established by this Department on Hudson river at Corinth October 1, 1906. Readings are taken each morning and night by E. H. Bowker. The record is maintained in coöperation with the U. S. Weather Bureau. Measurements of the flow at this point have been made by the U. S. Geological Survey. These measurements are connected to a gage which is read by the International Paper Company.

Mean Daily Gage Height, in Feet, of Hudson River at Corinth, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	—.20	0.70	3.30	6.85	2.50	3.20	0.25	0.00	—.10	0.80	0.85	0.40
2.....	—.25	0.50	4.40	6.90	2.55	3.10	0.15	0.00	—.10	0.70	0.70	0.40
3.....	—.25	0.50	5.00	6.30	3.20	2.70	0.05	—.10	—.10	0.45	0.70	0.40
4.....	—.25	0.50	4.90	5.50	3.20	2.25	0.00	0.25	0.25	0.35	0.80	0.30
5.....	—.30	0.45	4.75	4.85	3.10	2.20	0.00	0.50	0.20	0.25	0.95	0.20
6.....	—.30	0.40	4.35	4.45	2.70	2.90	0.00	0.65	0.50	0.30	1.15	0.20
7.....	—.40	0.40	4.30	4.65	2.60	3.70	0.00	0.45	0.60	0.35	1.35	0.15
8.....	—.30	0.30	4.30	4.15	2.50	3.95	0.00	0.20	0.70	0.25	1.15	0.10
9.....	—.30	0.30	4.10	3.70	2.40	3.75	0.00	0.10	0.70	0.30	0.90	0.10
10.....	—.30	0.25	3.70	3.40	2.80	3.30	0.00	0.00	0.55	0.35	0.80	0.05
11.....	—.35	0.30	3.45	2.90	2.40	3.15	—.10	0.15	0.40	0.40	0.70	0.00
12.....	—.30	0.30	3.20	2.90	1.90	3.25	—.20	0.80	0.35	0.40	0.65	—.05
13.....	—.35	0.30	2.85	2.65	1.60	3.05	—.20	0.80	0.20	0.45	0.60	—.10
14.....	—.30	0.35	2.75	2.25	1.55	2.80	—.10	0.45	0.20	0.40	0.60	—.10
15.....	—.30	0.40	2.50	2.05	1.50	2.30	0.00	0.30	0.20	0.50	0.55	—.10
16.....	—.35	0.40	2.30	1.70	1.35	2.15	—.10	0.10	0.20	0.50	0.50	—.10
17.....	—.30	0.40	2.10	1.55	1.15	2.30	—.10	0.20	0.10	0.40	0.45	—.10
18.....	—.20	0.40	1.75	1.40	1.00	2.20	—.10	0.20	0.10	0.35	0.40	—.10
19.....	—.20	0.35	1.65	3 05	1.05	2.10	—.10	0.20	0.10	0.45	0.40	—.10
20.....	—.15	0.40	1.60	3.70	1.05	1.85	—.10	0.10	0.05	0.40	0.25	—.20
21.....	0.05	0.40	1.70	3.90	1.40	1.55	—.20	0.10	0.00	0.35	0.10	—.10
22.....	0.75	0.50	2.20	3.75	1.50	1.40	—.10	0.00	—.05	0.30	0.10	—.10
23.....	1.80	0.50	2.60	3.30	1.50	1.20	—.10	0.10	—.10	0.30	0.35	—.10
24.....	2.00	0.50	3.20	2.65	1.45	0.95	—.20	0.00	—.10	0.40	0.40	0.15
25.....	1.85	0.55	4.15	2.30	2.00	0.75	—.10	0.00	0.00	0.50	0.35	0.30
26.....	1.75	0.60	5.00	2.60	3.45	0.65	—.20	0.00	0.25	0.50	0.30	0.30
27.....	1.60	0.65	5.50	3.30	3.65	0.55	—.20	—.10	0.55	0.60	0.40	0.30
28.....	1.35	1.65	5.50	3.40	3.55	0.50	—.10	—.10	1.20	0.85	0.40	0.30
29.....	1.20	......	5.65	3.10	3.20	0.50	0.00	—.10	2.00	1.00	0.40	0.30
30.....	1.05	......	6.10	2.95	2.85	0.40	0.10	—.10	1.30	1.00	0.40	0.40
31.....	0.95	......	6.60	......	2 95	......	0.00	—.10	......	1.00	......	0.40

Mean Daily Discharge, Second-feet, of Hudson River at Corinth, N. Y.

DAY.	Oct.	Nov.	Dec.
1906.			
1	2,000	3,010	3,610
2	2,000	3,010	*3,610
3	1,800	3,010	3,610
4	2,000	*3,010	3,310
5	2,000	2,450	3,010
6	2,000	2,450	3,010
7	*1,800	2,450	2,730
8	1,800	2,000	2,450
9	1,800	2,000	*2,220
10	1,800	2,000	2,220
11	1,800	*1,600	2,220
12	1,800	2,000	2,000
13	1,600	1,345	1,260
14	*1,600	1,345	2,450
15	1,600	1,345	3,010
16	1,600	1,345	*3,010
17	1,600	1,345	3,010
18	1,600	*2,000	3,010
19	1,600	2,450	3,010
20	1,600	3,610	3,010
21	*3,310	3,940	3,610
22	3,010	5,780	3,010
23	2,730	6,180	*2,730
24	2,730	5,000	2,450
25	2,730	*5,000	2,220
26	2,730	4,280	2,220
27	2,730	3,940	2,220
28	*3,010	3,940	2,220
29	2,730	3,940	2,450
30	2,730	3,610	*2,220
31	3,010	......	2,450
Mean	2,156	2,980	2,696

* Sunday.

Mean Daily Discharge, Second-feet, of Hudson River at Corinth, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	6,580	2,220	1,600	30,280	19,330	5,780	2,450	1,600	*810	4,280	9,180	*3,010
2	8,260	2,000	1,260	25,000	19,330	*5,000	3,010	1,600	810	5,780	7,400	3,310
3	9,180	*2,220	*1,260	19,840	19,330	4,280	3,010	1,430	960	6,580	*12,890	2,220
4	10,100	2,220	1,260	17,300	20,350	3,610	3,010	*1,430	2,000	4,280	14,320	2,000
5	11,950	2,220	1,260	14,800	*18,820	3,610	3,010	1,430	3,940	6,580	13,840	1,600
6	*12,420	2,220	1,260	14,320	19,330	3,010	5,000	1,260	5,000	*5,000	11,950	1,600
7	11,950	2,220	1,600	*12,890	19,330	2,450	*3,010	1,260	3,610	3,610	21,880	1,600
8	11,950	2,220	1,600	11,950	18,820	2,000	2,000	1,260	*2,450	5,000	24,480	*1,800
9	11,480	2,000	1,430	10,560	15,800	*3,010	2,000	1,260	2,000	11,020	23,960	2,000
10	9,640	*2,000	*1,430	9,180	13,840	3,610	1,800	1,260	2,000	11,020	*25,000	3,310
11	9,180	2,000	1,260	7,400	11,950	3,310	1,800	*1,260	2,220	11,020	17,800	12,890
12	9,180	2,220	1,260	7,400	*11,020	3,310	2,450	1,260	2,450	11,020	14,800	13,840
13	*6,580	2,220	1,260	7,400	9,180	3,310	1,800	1,260	3,610	*9,180	11,950	12,420
14	5,380	2,220	1,600	*7,400	7,400	3,010	*1,800	1,260	5,380	6,580	16,100	11,020
15	4,630	2,220	2,000	7,400	7,400	2,730	1,600	1,260	*4,280	5,380	8,260	*11,020
16	3,310	2,450	2,000	7,400	6,990	*3,010	1,430	1,110	3,310	3,940	6,580	11,020
17	2,220	*2,220	*2,450	7,400	7,820	3,010	1,430	960	2,450	3,610	*6,580	10,100
18	2,450	2,220	3,010	6,580	8,260	2,450	1,430	*960	2,220	3,940	5,000	7,400
19	2,730	2,220	3,010	5,380	*7,400	2,000	1,260	960	2,000	4,280	3,940	6,580
20	*3,010	2,220	3,010	5,380	6,180	2,000	1,260	1,600	1,600	*3,610	3,610	5,780
21	3,310	2,220	3,010	*5,000	5,000	3,010	*1,110	1,800	1,260	3,310	3,610	5,780
22	3,310	2,220	3,310	4,280	5,380	3,010	960	2,450	*1,260	3,310	3,610	*5,000
23	3,610	2,220	5,780	4,280	5,780	*2,450	960	1,600	1,260	3,010	3,310	4,280
24	3,610	*2,220	*10,560	9,180	4,630	2,450	2,000	1,800	2,220	2,450	*2,000	11,020
25	3,610	2,220	9,180	12,890	5,000	2,220	1,800	*1,800	2,450	2,220	3,010	11,950
26	2,730	2,000	11,020	16,300	*4,280	2,000	2,220	1,600	2,220	2,220	3,610	11,480
27	*2,220	1,600	11,020	19,840	6,580	3,610	2,450	1,600	2,450	*2,220	3,610	10,100
28	2,220	1,600	16,800	*20,860	6,580	2,730	*2,450	1,430	3,010	4,280	3,310	10,100
29	2,220	....	22,920	21,370	6,580	2,000	2,220	1,260	*3,010	12,420	3,010	*11,020
30	2,220	....	30,280	20,350	6,580	*2,220	2,000	960	3,610	11,950	3,010	11,950
31	2,220	....	*33,520	....	5,780	....	*1,800	810	....	11,020	....	11,950
Mean	5,918	2,145	6,201	12,320	10,647	3,007	2,082	1,380	2,528	5,939	9,520	7,392

* Sunday.

Mean Daily Discharge, Second-feet, of Hudson River at Corinth, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
1	9,870	675	*1,800	23,180	30,280	7,195	1,430	1,800	1,600	2,000	*2,335	2,450
2	9,180	*760	1,515	21,370	30,550	5,580	1,430	*1,600	1,430	2,220	1,900	2,220
3	8,490	760	1,185	18,565	*29,485	5,380	2,450	1,600	1,430	1,900	1,800	1,515
4	7,195	675	1,035	15,550	26,040	4,630	2,450	1,600	1,260	*1,700	1,700	1,345
5	*6,380	640	1,110	*13,360	23,700	3,775	*2,220	1,800	1,260	1,600	1,600	1,260
6	5,000	610	960	12,655	20,605	3,610	2,000	1,800	*1,260	1,600	1,600	*1,260
7	4,280	675	1,260	13,125	19,330	*2,730	2,450	1,800	1,260	1,430	1,600	1,430
8	4,110	760	*1,260	17,550	20,605	2,220	2,000	1,800	1,260	1,345	*1,430	1,700
9	3,775	*760	1,110	21,625	20,095	2,220	1,800	*2,000	1,260	1,345	1,345	2,110
10	3,160	675	960	20,605	*21,625	2,220	1,800	2,000	1,260	1,345	1,345	2,220
11	3,010	610	960	23,960	18,820	1,700	1,800	2,000	1,260	*1,515	1,430	1,700
12	*2,450	675	1,260	*25,000	16,800	1,260	*1,800	1,800	1,260	1,515	1,515	1,600
13	2,110	675	1,800	24,220	16,800	1,345	1,800	1,800	*1,110	1,430	1,800	*1,600
14	2,110	760	2,110	20,860	17,800	*1,260	1,800	1,800	1,110	1,345	1,700	1,800
15	2,450	1,110	*3,310	18,565	17,300	1,900	1,800	1,800	1,110	1,345	*1,600	2,000
16	1,800	*6,580	4,110	17,800	16,550	2,335	1,800	*1,800	1,110	1,260	1,900	1,260
17	1,800	8,950	4,630	16,550	*16,050	2,220	1,800	1,600	1,110	1,260	2,220	1,260
18	1,600	8,950	4,630	15,800	13,600	2,220	1,800	1,800	1,110	*1,260	2,220	1,260
19	*1,430	8,720	4,110	*15,800	11,950	2,220	*2,000	1,800	1,110	1,260	2,000	1,260
20	1,430	6,380	3,775	15,800	11,020	2,000	2,000	1,800	*960	1,110	2,000	*1,260
21	1,430	5,780	3,610	15,300	10,100	*2,000	2,000	1,800	960	1,110	2,870	1,110
22	1,430	5,190	*3,610	13,360	11,250	2,000	2,000	1,600	960	1,110	*1,515	960
23	1,600	*4,455	3,310	13,600	11,480	1,800	2,000	*1,600	1,110	1,110	1,800	810
24	1,345	3,610	4,815	13,840	*10,790	2,000	1,800	1,600	1,260	960	1,900	710
25	1,035	2,870	5,780	18,565	9,870	2,000	1,800	1,600	1,185	*960	2,110	675
26	*960	2,730	6,180	*20,605	9,180	1,800	*1,800	1,600	960	2,220	2,220	710
27	960	1,800	8,490	27,895	8,720	1,600	1,800	1,600	*885	2,450	2,450	*710
28	1,110	1,800	10,790	29,485	7,195	*1,700	1,800	1,600	885	2,450	2,870	710
29	1,110	1,800	*18,055	31,360	6,180	2,220	1,800	1,600	1,700	2,590	*3,010	710
30	1,110	......	18,820	28,955	6,785	1,260	2,000	*1,600	2,000	2,730	3,310	810
31	1,110	......	19,075	......	*7,610	......	2,000	1,600	......	2,730	......	810
Mean	3,059	2,774	4,691	19,497	16,070	2,547	1,911	1,729	1,214	1,620	1,970	1,330

* Sunday.

Mean Daily Discharge, Second-feet, of Hudson River at Corinth, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1	580	1,900	12,890	6,580	17,050	5,580	1,600	*1,260	1,110	1,260	1,110	1,345
2	580	1,515	11,715	8,040	*19,330	4,110	1,600	1,110	1,110	1,260	1,110	1,600
3	*580	1,035	9,870	9,180	20,860	3,940	1,430	960	1,110	*1,185	1,110	1,430
4	580	810	9,180	*10,790	19,585	4,280	*1,600	960	1,110	1,260	1,035	1,430
5	580	885	7,400	13,360	19,075	4,815	1,600	960	*960	1,200	960	*1,345
6	1,800	1,260	7,400	16,050	16,300	*7,195	1,600	960	960	1,110	960	1,260
7	3,160	*2,590	*5,980	22,920	15,800	7,195	1,600	960	1,035	960	*960	1,185
8	3,010	2,730	5,380	29,750	17,300	6,580	1,430	*1,110	960	810	1,185	1,035
9	2,870	3,010	5,000	26,835	*17,550	5,780	1,430	1,260	885	760	1,260	810
10	*2,590	2,335	4,815	25,780	17,550	5,000	1,260	1,260	885	*810	1,185	810
11	2,450	2,220	5,380	*23,180	23,700	6,990	*1,260	1,260	810	960	1,110	960
12	2,220	2,110	4,815	19,585	28,160	6,380	1,260	1,260	*810	1,110	1,035	*960
13	2,220	1,900	4,630	19,840	23,440	*5,780	1,260	1,110	960	1,035	1,110	885
14	2,000	*1,900	*4,280	29,485	19,840	5,190	1,260	1,110	960	810	*885	1,110
15	2,000	2,000	3,940	37,570	17,550	5,190	1,260	*810	1,035	810	1,110	1,110
16	1,600	2,110	3,940	36,490	*16,050	4,815	1,430	1,430	1,035	885	960	1,110
17	*1,600	2,335	3,610	34,330	15,300	4,630	1,260	1,600	1,110	*960	1,110	1,185
18	1,600	1,800	3,310	*34,600	18,055	5,980	*1,260	2,450	960	1,035	1,110	1,035
19	1,600	1,800	3,460	31,630	17,050	5,780	1,260	2,000	*960	1,035	1,515	*960
20	1,600	4,110	3,610	32,170	14,560	*5,190	1,430	1,430	1,110	1,110	1,345	885
21	1,515	*4,455	*3,940	32,170	12,655	4,630	1,600	1,260	960	1,185	*1,035	960
22	1,430	5,000	3,010	29,485	12,185	4,110	1,600	*810	810	1,260	1,185	1,110
23	1,430	5,000	3,310	26,835	*11,250	3,460	1,800	960	810	1,185	1,260	1,110
24	*1,345	5,580	3,310	24,480	9,870	3,160	1,800	810	810	*1,260	1,260	960
25	2,000	11,950	4,630	*20,605	9,410	3,010	*1,800	960	960	1,185	1,345	810
26	3,610	11,715	6,380	19,075	8,260	2,730	1,600	1,110	*960	1,110	1,430	*810
27	3,610	11,950	7,195	18,055	6,180	*2,000	1,430	1,260	1,110	1,110	1,515	810
28	3,610	*11,250	*8,640	16,550	5,580	1,700	1,260	1,260	1,345	1,260	*1,515	810
29	3,310	....	6,785	15,800	6,380	1,600	1,260	*1,110	1,200	1,260	1,900	960
30	3,160	....	6,180	15,300	*7,195	1,515	1,110	1,110	1,260	1,035	1,430	1,035
31	*3,010	....	6,380	....	6,990	....	1,260	1,110	....	*1,110	....	1,110
Mean	2,040	3,831	5,799	22,884	15,163	4,610	1,439	1,194	1,005	1,077	1,201	1,062

* Sunday.

Mean Daily Discharge, Second-feet, of Hudson River at Corinth, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	960	2,730	13,360	31,630	9,640	12,890	1,700	1,260	1,110	3,010	3,160	2,000
2	885	2,220	18,820	31,900	9,870	12,420	1,515	1,260	1,110	2,730	2,730	2,000
3	885	2,220	21,880	28,690	12,890	10,560	1,345	1,110	1,110	2,110	2,730	2,000
4	885	2,220	21,370	24,480	12,890	8,490	1,260	1,700	1,700	1,900	3,010	1,800
5	810	2,110	20,605	21,115	12,420	8,260	1,260	2,220	1,600	1,700	3,460	1,600
6	810	2,000	18,565	19,075	10,560	11,480	1,260	2,590	2,220	1,800	4,110	1,600
7	710	2,000	18,310	20,095	10,100	15,300	1,260	2,110	2,450	1,900	4,815	1,515
8	810	1,800	18,310	17,550	9,640	16,550	1,260	1,600	2,730	1,700	4,110	1,430
9	810	1,800	17,300	15,300	9,180	15,550	1,260	1,430	2,730	1,800	3,310	1,430
10	810	1,700	15,300	13,840	11,020	13,360	1,260	1,260	2,335	1,900	3,010	1,345
11	760	1,800	14,080	11,480	9,180	12,655	1,110	1,515	2,000	2,000	2,730	1,260
12	810	1,800	12,890	11,480	6,990	13,125	960	3,010	1,900	2,000	2,590	1,185
13	760	1,800	11,250	10,330	5,780	12,185	960	3,010	1,600	2,110	2,450	1,110
14	810	1,900	10,790	8,490	5,580	11,020	1,110	2,110	1,600	2,000	2,450	1,110
15	810	2,000	9,640	7,610	5,380	8,720	1,260	1,800	1,600	2,220	2,335	1,110
16	760	2,000	8,720	6,180	4,815	8,040	1,110	1,430	1,600	2,220	2,220	1,110
17	810	2,000	7,820	5,580	4,110	8,720	1,110	1,600	1,430	2,000	2,110	1,110
18	960	2,000	6,380	5,000	3,610	8,260	1,110	1,600	1,430	1,900	2,000	1,110
19	960	1,900	5,980	12,185	3,775	7,820	1,110	1,600	1,430	2,110	2,000	1,110
20	1,035	2,000	5,780	15,300	3,775	6,785	1,110	1,430	1,345	2,000	1,700	960
21	1,345	2,000	6,180	16,300	5,000	5,580	960	1,430	1,260	1,900	1,430	1,110
22	2,870	2,220	8,260	15,550	5,380	5,000	1,110	1,260	1,185	1,800	1,430	1,110
23	6,580	2,220	10,100	13,360	5,380	4,280	1,110	1,430	1,110	1,800	1,900	1,110
24	7,400	2,220	12,890	10,330	5,190	3,460	960	1,200	1,110	2,000	2,000	1,515
25	6,785	2,335	17,550	8,720	7,400	2,870	1,110	1,260	1,260	2,220	1,900	1,800
26	6,380	2,450	21,880	10,100	14,080	2,590	960	1,260	1,700	2,220	1,800	1,800
27	5,780	2,590	24,480	13,360	15,050	2,335	960	1,110	2,335	2,450	2,000	1,800
28	4,815	5,980	24,480	13,840	14,560	2,220	1,110	1,110	4,280	3,160	2,000	1,800
29	4,280	......	25,260	12,420	12,890	2,220	1,260	1,110	7,400	3,610	2,000	1,800
30	3,775	......	27,630	11,715	11,250	2,000	1,430	1,110	4,630	3,610	2,000	2,000
31	3,460	......	30,280	......	11,715	......	1,260	1,110	......	3,610	......	2,000
Mean	2,268	2,215	15,682	14,767	8,681	8,492	1,179	1,584	2,043	2,242	2,516	1,475

Monthly Discharge of Hudson River at Corinth, N. Y.

[Drainage area, 2,728 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1906.					
October	3,310	1,600	2,156	0.790	0.908
November	6,180	1,345	2,980	1.09	1.22
December	3,610	1,260	2,696	0.988	1.14
1907.					
January	12,420	2,220	5,918	2.17	2.50
February	2,450	1,600	2,145	0.786	0.817
March	33,520	1,260	6,201	2.27	2.61
April	30,280	4,280	12,320	4.52	5.06
May	20,350	4,280	10,647	3.90	4.48
June	5,780	2,000	3,007	1.10	1.23
July	5,000	960	2,082	0.763	0.877
August	2,450	810	1,380	0.506	0.582
September	5,380	810	2,528	0.927	1.04
October	12,420	2,220	5,939	2.18	2.51
November	25,000	2,000	9,520	3.49	3.91
December	13,840	1,600	7,392	2.71	3.12

Monthly Discharge of Hudson River at Corinth, N. Y.—(Concluded).

[Drainage area, 2,728 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1908.					
January	9,870	960	3,059	1.12	1.29
February	8,950	610	2,873	1.05	1.13
March	19,075	960	4,691	1.72	1.98
April	31,360	12,655	19,497	7.15	8.01
May	30,550	6,180	16,070	5.89	6.77
June	7,195	1,260	2,547	0.934	1.05
July	2,450	1,430	1,911	0.701	0.806
August	2,000	1,600	1,729	0.634	0.729
September	2,000	885	1,214	0.445	0.498
October	2,730	960	1,620	0.594	0.683
November	3,310	1,345	1,970	0.722	0.809
December	2,450	675	1,330	0.488	0.561
1909.					
January	3,610	580	2,040	0.748	0.860
February	11,950	810	3,831	1.40	1.46
March	12,890	3,010	5,799	2.13	2.45
April	37,570	6,580	22,884	8.39	9.40
May	28,160	5,580	15,163	5.56	6.39
June	7,195	1,515	4,610	1.69	1.89
July	1,800	1,110	1,439	0.527	0.606
August	2,450	810	1,194	0.438	0.504
September	1,345	810	1,005	0.368	0.412
October	1,260	760	1,077	0.395	0.454
November	1,900	885	1,201	0.440	0.493
December	1,600	810	1,062	0.389	0.447
1910.					
January	7,400	760	2,268	0.831	0.956
February	5,980	1,700	2,215	0.812	0.844
March	30,280	5,780	15,682	5.75	6.61
April	31,900	5,000	14,767	5.41	6.06
May	15,050	3,610	8,681	3.18	3.66
June	16,550	2,000	8,492	3.11	3.48
July	1,700	960	1,179	0.432	0.497
August	3,010	1,110	1,584	0.581	0.668
September	7,400	1,110	2,043	0.749	0.839
October	3,610	1,700	2,242	0.822	0.945
November	4,815	1,430	2,516	0.922	1.03
December	2,000	960	1,475	0.541	0.622

HUDSON RIVER AT THURMAN, N. Y.

This station is located at the Delaware and Hudson railroad bridge leading from Thurman to Warrensburg, about 950 feet below the highway bridge to Warrensburg and some 2,000 feet below the entrance of Schroon river into the Hudson. It was established, in coöperation with the New York State Water Supply Commission, September 22, 1907, to obtain general statistical and comparative data regarding the flow of the Hudson river.

There is a dam on Schroon river at Warrensburg, about three miles above the station. On the Hudson there is a dam at Luzerne about twelve miles below. During the winter months the discharge is affected by ice, and the station discontinued.

The datum of the chain gage attached to the bridge has remained the same during the maintenance of the station. Conditions for obtaining accurate discharge data are excellent and a very good rating curve has been developed. All measurements are made from the bridge.

The regimen of flow of the Upper Hudson, especially during the low-water season, has been considerably affected by storage in Indian Lake reservoir.

Information in regard to this station is contained in the annual reports of the State Water Supply Commission of New York.

Observation at this station discontinued November 30, 1910.

Current-meter Discharge Measurements of Hudson River at Thurman, N. Y.

DATE.	Hydrographer.	Mean gage reading.	Total area.	Total width.	Corrected discharge.
1907.			*Square feet.*	*Feet.*	*Second-feet.*
August 28	Barrows and Hoyt	2.86	757	260	1,150
August 31	Barrows and Hoyt	2.49	683	251	832
September 1	Barrows and Hoyt	2.46	662	253	777
September 22	W. G. Hoyt	2.05	550	230	476
September 30	Pierson	3.48	962	275	2,640
September 30	Pierson	3.47	960	275	2,700
October 15	Pierson	3.52	963	277	2,800
October 26	Pierson	2.75	769	260	1,400
November 4	Pierson	4.98	1,460	299	6,760
November 13	Pierson	4.54	1,280	301	5,790
November 18	Pierson	3.58	991	280	2,970
December 12	Pierson	4.60	1,270	292	6,340
1908.					
June 23	D. M. Wood	3.03	846	272	1,600
July 4	G. M. Brett	3.07	863	272	1,510
August 6	Brett and Allen	2.46	698	262	860
August 6	Brett and Allen	2.49	694	262	835
September 19	D. M. Wood	2.25	623	247	609
1909.					
May 21	C. C. Covert	4.98	1,360	305	6,900
August 25	W. G. Hoyt	2.50	688	255	886

Current-meter Discharge Measurements of Hudson River at Thurman, N. Y.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
1910.		*Feet.*	*Square feet.*	*Feet per second.*	*Feet.*	*Second-feet.*
April 1	W. G. Hoyt	312	2,050	7.42	7.14	15,200
April 2	W. G. Hoyt	315	2,120	7.26	7.28	15,400
April 5	W. G. Hoyt	308	1,580	5.89	5.69	9,300
April 21	W. G. Hoyt	284	1,200	3.82	4.21	4,580
April 21	W. G. Hoyt	293	1,280	3.78	4.30	4,850
June 16	Covert and Phelan	279	1,050	3.01	3.76	3,270
Aug. 7	Phelan and Carman	261	789	1.68	2.80	1,330
Nov. 1	J. J. Phelan	270	881	2.21	3.23	1,950

Mean Daily Discharge, Second-feet, of Hudson River at Thurman, N. Y.

DAY.	Sept.	Oct.	Nov.	Dec.
1907.				
1	772	3,480	3,260	1,900
2	844	3,900	2,940	1,860
3	1,010	2,250	4,210	1,840
4	1,560	2,030	6,770	1,780
5	2,870	2,110	6,050	1,760
6	2,570	1,770	5,900	1,720
7	1,940	2,030	11,200	1,700
8	1,300	3,260	10,900	1,680
9	1,280	5,760	9,860	1,680
10	997	5,760	9,110	3,210
11	796	7,400	7,400	5,880
12	2,590	4,430	6,380	5,030
13	3,360	3,930	5,670	4,350
14	2,850	3,160	4,950	4,090
15	2,110	2,700	4,180	3,740
16	1,720	2,290	3,640	4,320
17	1,220	2,090	3,330	3,740
18	932	1,860	2,940	3,360
19	808	1,660	2,590	3,110
20	772	1,720	2,340	2,990
21	590	1,840	2,400	2,800
22	560	1,920	2,430	2,590
23	1,040	1,600	2,400	2,750
24	1,440	1,440	2,310	5,580
25	1,420	1,400	2,270	5,640
26	1,450	1,550	2,270	5,440
27	1,320	1,660	2,200	5,150
28	1,270	3,280	2,030	4,950
29	1,660	5,270	2,010	5,090
30	2,550	4,690	1,990	5,300
31	......	3,900	......	6,020
Mean	1,520	2,980	4,530	3,580

Mean Daily Discharge, Second-feet, of Hudson River at Thurman, N. Y.

DAY.	Jan.	Feb.*a*	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
1	5,300	......	......	8,870	14,200	3,300	1,230	1,070	720	818	760	1,380
2	5,270	......	......	8,270	12,500	3,210	1,360	888	875	750	818	1,100
3	4,830	......	......	7,070	11,600	3,060	1,400	912	818	864	700	1,010
4	4,180	......	......	6,470	11,200	2,680	1,820	1,040	680	972	750	806
5	3,560	......	......	6,050	10,200	2,380	1,680	950	626	794	690	975
6	3,160	......	......	5,700	9,740	2,400	1,740	829	852	750	771	1,040
7	3,360	......	......	6,440	8,150	2,050	1,700	912	864	750	660	*a*
8	3,740	......	......	8,180	10,500	1,560	1,940	925	700	710	783	......
9	4,540	......	......	9,710	9,530	1,530	1,780	950	700	760	643	......
10	*a*	......	......	9,500	8,930	1,920	1,560	938	750	772	740	......
11	......	......	......	9,890	8,270	1,490	1,400	900	652	840	730	......
12	......	......	......	10,000	9,230	1,310	1,350	1,030	740	670	670	......
13	......	......	......	9,620	10,100	1,800	1,440	1,080	592	720	760	......
14	......	......	......	8,570	10,600	1,530	1,350	925	690	720	912	......
15	......	......	......	7,880	10,900	1,420	1,380	975	794	750	1,560	......
16	......	......	......	7,670	10,300	1,330	1,300	829	710	680	1,190	......
17	......	......	......	7,190	8,330	1,380	1,420	1,130	760	720	988	......
18	......	......	......	6,890	6,290	1,260	1,560	1,030	710	772	829	......
19	......	......	......	7,280	5,700	1,190	1,490	1,200	609	680	730	......
20	......	......	......	6,980	6,650	1,300	2,400	988	626	710	740	......
21	......	......	......	6,170	5,640	1,400	2,030	1,030	710	626	740	......
22	......	......	......	5,760	4,890	1,680	1,450	1,040	680	660	652	......
23	......	......	......	5,700	7,790	1,600	829	938	750	609	690	......
24	......	......	*a*	6,770	6,350	1,470	806	806	740	584	730	......
25	......	......	7,310	8,360	4,770	1,310	794	962	710	530	829	......
26	......	......	6,290	9,140	4,570	1,310	568	829	772	660	852	......
27	......	......	7,370	14,400	4,070	1,230	1,260	794	552	1,170	1,330	......
28	......	......	8,060	14,300	3,960	962	1,250	794	700	1,080	2,030	......
29	......	......	9,500	14,300	3,400	1,000	1,100	888	988	1,030	1,720	......
30	......	......	9,200	12,400	3,090	1,030	1,310	840	760	1,080	1,550	......
31	......	......	9,620	......	3,300	......	1,140	818	......	925	......	......
Mean	......	......	......	8,520	7,890	1,700	1,410	943	728	779	919	......

a River frozen, January 10 to March 24, inclusive, and from Dec. 7 to 31, inclusive.

Mean Daily Discharge, Second-feet, of Hudson River at Thurman, N. Y.

DAY.	Jan.*a*	Feb.*a*	Mar.*a*	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1	......	......	......	2,800	7,580	3,360	1,380	806	1,040	1,010	710	852
2	......	......	......	3,180	8,630	2,590	1,350	829	1,030	1,060	740	888
3	......	......	......	3,400	8,450	3,090	1,280	829	988	999	750	864
4	......	......	......	3,740	8,060	2,400	1,140	740	950	938	829	864
5	......	......	......	4,430	8,870	2,890	1,160	730	1,010	852	806	824
6	......	......	......	5,180	8,660	3,700	1,080	783	962	720	772	783
7	......	......	......	9,920	10,300	4,510	1,030	760	900	720	700	700
8	......	......	......	11,500	11,500	4,400	925	912	925	680	840	652
9	......	......	......	11,100	9,320	3,880	925	1,110	900	912	888	690
10	......	......	3,100	10,500	10,200	3,380	950	1,140	925	852	852	643
11	......	......	2,600	8,960	12,900	4,860	700	1,080	925	900	852	*a*
12	......	......	2,800	5,210	15,700	3,460	1,080	1,100	912	852	783	......
13	......	......	2,700	5,270	11,100	3,040	1,060	1,100	925	700	740	......
14	......	......	2,600	15,800	10,800	2,850	1,190	1,070	900	568	760	......
15	......	......	2,500	17,300	8,480	2,920	1,200	1,040	900	794	772	......
16	......	......	2,400	16,200	7,940	2,380	1,200	1,170	888	840	783	......
17	......	......	2,200	15,400	8,240	2,250	1,190	1,280	900	592	912	......
18	......	......	2,100	15,300	8,900	2,570	1,030	1,330	888	740	772	......
19	......	......	2,000	13,900	7,940	4,180	1,110	1,060	760	700	772	......
20	......	......	2,000	15,200	7,010	2,940	1,140	1,200	900	700	783	......
21	......	......	1,900	14,000	6,710	8,150	1,600	740	829	700	783	......
22	......	......	1,800	12,500	7,460	2,430	1,700	594	806	760	772	......
23	......	......	1,700	11,300	6,140	1,990	1,400	448	829	794	760	......
24	......	......	1,800	10,200	5,380	1,960	1,380	435	925	760	760	......
25	......	......	1,900	8,570	4,920	1,820	1,170	975	840	852	618	......
26	......	......	2,100	9,230	4,490	1,740	900	1,080	783	818	1,230	......
27	......	......	2,100	7,580	3,530	1,580	806	1,110	852	800	1,130	......
28	......	......	2,100	8,090	3,090	1,510	840	1,100	1,040	800	1,060	......
29	......	......	2,200	6,890	3,200	1,600	700	1,080	975	783	1,070	......
30	......	......	2,200	7,670	5,270	1,380	875	1,060	975	730	1,060	......
31	......	......	2,300	......	2,870	......	950	1,060	......	720	......	......

a Ice obstruction, January to March, and December.

NOTE.— Daily discharge, March 10 to 31, estimated from the daily discharge at North Creek and Riverbank.

Mean Daily Discharge, Second-feet, of Hudson River at Thurman, N. Y.

DAY.	Jan.*a*	Feb.*a*	Mar.*a*	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.*a*
1910.												
1	......	......	......	15,400	4,070	6,220	1,260	1,000	1,160	1,380	2,110	......
2	......	......	......	15,900	5,830	5,740	864	1,080	1,490	1,130	2,010	......
3	......	......	......	12,500	3,280	4,860	720	829	1,510	1,200	2,030	......
4	......	......	......	10,600	5,000	4,290	700	1,380	1,450	1,060	2,050	......
5	......	......	......	10,400	4,660	3,850	1,130	1,720	1,600	1,070	2,200	......
6	......	......	......	8,350	5,470	4,980	988	1,450	1,660	950	2,380	......
7	......	......	......	9,380	4,690	6,190	950	1,140	1,940	1,660	2,290	......
8	......	......	......	10,100	5,440	6,310	900	1,030	2,380	1,580	2,090	......
9	......	......	......	7,480	4,720	6,840	730	852	1,920	1,550	2,890	......
10	......	......	......	6,100	5,060	5,920	643	740	1,820	1,680	1,700	......
11	......	......	......	4,770	4,980	5,060	710	1,060	1,530	1,640	1,510	......
12	......	......	......	5,770	3,690	5,090	690	2,470	1,470	1,490	1,420	......
13	......	......	......	4,890	3,160	4,770	962	2,050	1,330	1,560	1,230	......
14	......	......	......	3,330	3,160	4,210	864	3,360	1,220	1,600	1,220	......
15	......	......	......	3,710	3,090	3,770	829	1,230	1,060	1,470	1,300	......
16	......	......	......	4,260	2,470	3,300	710	1,400	962	1,260	1,260	......
17	......	......	......	2,800	2,220	3,300	643	1,440	988	1,300	1,080	......
18	......	......	......	2,570	2,310	3,280	875	1,420	1,000	1,330	912	......
19	......	......	......	5,060	1,940	4,350	875	1,400	1,110	1,490	888	......
20	......	......	......	10,500	1,820	3,180	852	1,130	950	1,560	852	......
21	......	......	......	5,950	2,380	2,940	829	980	950	1,550	772	......
22	......	......	......	5,180	2,220	2,640	860	829	1,030	1,400	888	......
23	......	......	......	6,220	2,450	2,290	772	975	938	1,470	1,260	......
24	......	......	......	5,210	2,520	1,920	600	975	962	1,700	1,250	......
25	......	......	......	5,040	3,280	1,780	772	975	1,070	1,740	1,200	......
26	......	......	......	4,870	6,040	1,620	730	900	1,160	1,680	1,160	......
27	......	......	10,100	4,710	6,010	1,560	660	829	1,230	2,220	1,170	......
28	......	......	10,200	4,550	5,410	1,550	643	652	2,430	2,360	1,110	......
29	......	......	11,700	4,390	4,690	1,510	900	900	2,270	2,430	1,200	......
30	......	......	13,800	4,230	4,740	1,420	794	875	1,960	2,380	1,280	......
31	......	......	15,200	......	5,740	......	1,000	840	......	2,880	......	......
Mean	......	......	......	6,810	3,950	3,800	819	1,220	1,420	1,590	1,490	......

a Ice obstruction, January to March, and December.

Monthly Discharge of Hudson River at Thurman, N. Y.
[Drainage area, 1,550 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1907.					
September	3,360	584	1,520	0.981	1.09
October	7,400	1,400	2,980	1.92	2.21
November	11,200	1,990	4,530	2.92	3.26
December	6,020	1,680	3,580	2.31	2.66
1908.*a*					
January	5,300	....	(2,620)	1.69	1.95
February	....	....	(3,630)	2.34	2.52
March	9,620	....	(4,750)	3.06	3.53
April	14,400	5,700	8,520	5.50	6.14
May	14,200	3,090	7,900	5.10	5.88
June	3,300	962	1,700	1.10	1.23
July	2,400	568	1,410	0.910	1.05
August	1,200	794	943	0.608	0.70
September	988	552	728	0.470	0.52
October	1,170	530	779	0.503	0.58
November	2,030	643	919	0.593	0.66
December	....	....	(900)	0.581	0.67
The year	14,400	530	2,900	1.87	25.43
1909.*b*					
January	....	....	(1,100)	0.710	0.82
February	....	....	(2,700)	1.74	1.81
March	....	1,700	(2,610)	1.68	1.94
April	17,300	2,800	9,680	6.25	6.97
May	15,700	2,870	7,860	5.07	5.84
June	8,150	1,380	2,990	1.93	2.15
July	1,700	700	1,110	0.716	0.83
August	1,330	435	960	0.619	0.71
September	1,040	760	913	0.589	0.66
October	1,060	568	795	0.513	0.59
November	1,230	618	835	0.539	0.60
December	....	....	(800)	0.516	0.59
The year	17,300	435	2,700	1.74	23.51
1910.*c*					
January	....	....	(1,650)	(1.06)	(1.22)
February	....	....	(1,300)	(0.839)	(0.87)
March	....	....	(7,600)	(4.90)	(5.65)
April	15,900	2,570	6,810	4.39	4.90
May	6,040	1,820	3,950	2.55	2.94
June	6,310	1,420	3,800	2.45	2.73
July	1,260	600	819	0.528	0.61
August	3,360	652	1,220	0.787	0.91
September	2,430	938	1,420	0.916	1.02
October	2,430	950	1,590	1.03	1.19
November	2,890	772	1,490	0.961	1.07
December	....	....	(860)	(0.555)	(0.64)
The year	15,900	600	2,710	1.75	23.75

a Discharge during frozen period, January to March and December, 1908, estimated on basis of the combined discharge of Hudson river at North Creek and Schroon river at Riverbank.

Discharge, January 10–31, 1,970 second-feet.
" March 1–24, 3,750 " "
" December 7–31, 864 " "

b The mean discharge for January, February, March and December, 1909, was determined from the sum of the corresponding discharge for North Creek and Riverbank, plus an estimated inflow.

c Discharge during frozen period, January, February, March and December, 1910, was determined from the basis of the combined flow at North creek and Schroon river at Riverbank, plus an estimated inflow.

HUDSON RIVER AT NORTH CREEK, N. Y.

This station is located on the steel highway bridge at North Creek. It was established by the U. S. Geological Survey in coöperation with the New York State Water Supply Commission, September 21, 1907, to obtain general statistical and comparative data in regard to the flow of the Hudson.

North creek, a small tributary of the Hudson, enters from the right a short distance below this point.

The datum of the chain gage attached to the bridge has remained the same during the maintenance of the station. During the winter months the discharge is affected by the presence of ice. Conditions for obtaining accurate discharge data are good and a very good rating curve has been developed. All discharge measurements are made from the bridge.

The regimen of flow of the Upper Hudson, especially during the low-water season, has been considerably affected by storage in Indian Lake reservoir.

Information in regard to this station is contained in the annual reports of the United States Geological Survey.

Current-meter Discharge Measurements of Hudson River at North Creek, N. Y.

DATE.	Hydrographer.	Mean gage reading.	Total area.	Total width.	Corrected discharge.
			Square feet.	*Feet.*	*Second-feet.*
1907.					
Aug. 29	Barrows and Hoyt	2.91	547	235	788
Aug. 31	W. G. Hoyt	2.90	502	235	716
Sept. 20	W. G. Hoyt	2.71	506	237	618
Sept. 21	Pierson and Hoyt	2.55	462	236	512
Oct. 1	Pierson	4.09	834	250	2,380
Oct. 24	Pierson	2.96	547	239	890
Nov. 12	Pierson	4.52	937	250	3,290
Nov. 16	Pierson	3.43	673	143	1,560
1908.					
Jan. 22	Wood and Pierson	2.99	523	240	810
July 7	G. M. Brett	3.06	576	243	990
Aug. 7	Brett and Allen	2.87	534	241	775
Sept. 18	D. M. Wood	2.54	453	236	469

Current-meter Discharge Measurements of Hudson River at North Creek, N. Y.—(Concluded).

DATE.	Hydrographer.	Mean gage reading.	Total area.	Total width.	Corrected discharge.
1909.			*Square feet.*	*Feet.*	*Second-Feet.*
Jan. 1	C. R. Adams	2.89	427	215	[a]419
Jan. 20	C. R. Adams	3.46	463	225	[b]452
Mar. 27	C. C. Covert	4.12	598	248	[c]990
April 14	C. C. Covert	8.35	1,990	250	14,200
April 16	E. F. Weeks	7.74	1,740	250	11,400
April 18	E. F. Weeks	7.40	1,660	250	10,200
May 9	E. F. Weeks	6.32	1,390	250	7,040
May 21	C. C. Covert	4.78	1,010	250	3,510
June 17	Covert and Cooper	3.00	549	230	865
Aug. 24	W. G. Hoyt	2.73	524	245	653
Aug. 25	W. G. Hoyt	2.95	566	245	796
Dec. 9	Hoyt and James	2.32	386	243	[d]277
Dec. 11	Hoyt and James	2.48	448	237	[d]373

[a] Measurement made under partial ice cover; gage height to top of ice, 2.98 feet; average thickness of ice, 0.76 foot.

[b] Measurement made under complete ice cover; gage height to top of ice, 3.56 feet; average thickness of ice, 0.98 foot.

[c] Measurement made under partial ice cover; gage height to top of ice, 4.42 feet; average thickness of ice, 0.88 foot.

[d] Measurement made under ice conditions.

Current-meter Discharge Measurements of Hudson River at North Creek, N. Y.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
1910.		*Feet.*	*Square feet.*	*Feet per second.*	*Feet.*	*Second-feet.*
Jan. 19	W. G. Hoyt	240	320	0.86	3.32	[a]276
Feb. 16	C. C. Covert	252	556	1.17	4.60	[b]652
April 2	W. G. Hoyt	247	1,680	5.94	7.23	9,980
April 6	W. G. Hoyt	248	1,070	3.92	5.08	4,200
April 21	W. G. Hoyt	248	778	2.44	3.80	1,900
June 17	Covert and Phelan	248	668	2.12	3.48	1,420
July 12	W. A. James	238	480	1.37	2.62	645
Nov. 11	F. J. Shuttleworth	242	530	1.58	3.01	835
Dec. 31	F. J. Shuttleworth	210	440	1.26	3.02	[c]556

[a] Measurement made under complete ice cover. Gage height to top of ice, 3.35 feet; average thickness of ice, 1.3 feet.

[b] Measurement made under complete ice cover. Gage height to top of ice, 4.93 feet; average thickness of ice, 1.95 feet.

[c] Measurement made under partial ice cover. Gage height to top of ice, 3.03 feet; average thickness of ice, 1.2 feet.

Mean Daily Discharge, Second-feet, of Hudson River at North Creek, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1......	417	600	2,300	1,290	4,790	1,400	388	736	910	880	637	556
2......	410	600	2,100	1,860	6,130	1,380	310	709	890	840	628	580
3......	398	500	1,900	2,420	5,880	1,710	340	673	890	810	700	580
4......	349	500	1,700	2,990	5,440	1,720	370	637	890	781	700	512
5......	338	500	1,450	3,550	6,430	1,380	382	646	900	682	700	484
6......	505	600	1,350	4,110	4,790	2,160	320	646	860	628	691	414
7......	642	1,070	1,320	4,860	5,930	2,430	330	763	840	610	718	414
8......	686	1,300	1,300	7,710	9,140	2,290	376	950	850	682	840	352
9......	775	1,100	1,280	7,360	6,530	1,890	340	950	830	810	840	277
10......	898	900	1,260	6,130	8,480	1,450	315	940	830	745	970	340
11......	718	850	1,240	4,920	11,700	2,430	448	940	830	754	940	373
12......	702	800	1,200	3,520	14,700	2,300	610	940	810	745	870	385
13......	642	820	1,180	3,290	8,110	1,520	682	940	810	530	718	451
14......	598	840	1,140	12,400	8,050	1,380	718	920	790	570	628	640
15......	471	860	1,090	13,600	4,700	1,300	745	910	790	718	578	625
16......	510	880	1,030	11,800	4,050	1,010	745	980	800	718	570	610
17......	498	900	980	10,500	4,260	990	754	980	763	673	610	440
18......	486	940	940	9,970	5,390	1,100	772	940	736	700	1,160	412
19......	459	940	900	9,060	4,260	2,370	1,100	570	781	700	810	385
20......	432	1,600	860	10,900	3,290	1,250	1,100	346	781	700	578	345
21......	432	2,100	840	9,790	3,370	1,550	1,300	290	718	700	570	325
22......	432	2,500	820	7,710	4,050	970	1,380	272	745	700	570	321
23......	432	2,300	800	6,900	3,060	790	1,170	290	745	700	594	325
24......	432	2,100	856	5,560	2,290	718	1,100	448	790	722	628	313
25......	1,040	2,400	900	4,260	2,370	682	850	910	781	745	754	313
26......	1,290	2,500	948	5,930	2,030	610	646	950	736	745	1,040	345
27......	1,200	2,500	948	3,920	1,590	530	646	950	718	736	890	396
28......	1,000	2,400	950	4,920	1,580	495	586	940	790	736	810	402
29......	800	......	950	3,680	3,330	467	602	930	790	745	709	412
30......	700	......	950	3,680	2,540	430	830	930	810	972	646	440
31......	600	......	950	......	1,380	......	790	930	......	646	......	451

Mean Daily Discharge, Second-feet, of Hudson River at North Creek, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	450	680	8,000	9,790	2,080	3,380	474	810	940	840	1,550	450
2......	425	660	7,500	9,640	2,600	2,920	454	754	1,120	682	1,480	443
3......	420	640	7,000	7,080	3,140	2,210	430	772	1,040	602	1,480	490
4......	400	620	6,500	5,200	4,630	1,890	412	1,010	1,100	562	1,450	466
6......	375	600	5,800	4,860	4,260	1,800	382	1,350	1,100	562	1,080	415
6......	350	610	5,000	4,860	3,250	2,240	364	1,100	1,310	554	1,420	380
7......	325	615	4,300	5,020	3,330	3,230	340	940	1,550	1,280	1,420	360
8......	300	620	3,700	5,730	3,140	3,660	340	718	1,650	1,200	1,160	514
9......	300	625	3,300	3,580	4,260	3,420	325	610	1,480	1,100	990	530
10......	300	630	2,800	2,570	2,710	2,870	310	700	1,380	1,150	890	530
11......	300	635	2,500	3,330	3,010	2,480	295	1,320	1,160	1,200	840	548
12......	300	642	2,300	3,580	1,770	2,550	594	2,240	990	1,120	870	415
13......	300	644	2,100	2,710	1,450	2,350	594	1,590	930	1,120	790	350
14......	300	646	2,000	2,260	1,500	2,000	570	1,250	910	1,100	736	394
15......	300	648	1,800	890	1,280	1,800	530	890	870	1,010	691	429
16......	300	652	1,700	2,050	1,040	1,580	562	1,220	790	940	655	394
17......	290	640	1,600	628	910	1,430	562	1,100	736	910	610	350
18......	280	630	1,600	1,450	810	1,680	562	1,100	700	910	530	415
19......	275	620	1,600	2,000	890	1,840	530	1,040	682	1,080	488	450
20......	400	620	1,600	6,380	910	1,550	530	970	664	1,100	400	530
21......	800	640	1,600	3,140	1,170	1,450	530	840	664	1,080	330	436
22......	3,400	660	1,900	1,740	1,250	1,220	538	840	700	1,120	466	436
23......	5,400	680	2,540	2,710	1,420	990	530	840	673	1,160	490	450
24......	4,800	700	2,540	1,320	1,280	870	530	790	655	1,220	490	450
25......	4,200	720	5,200	1,740	1,740	772	530	736	646	1,200	490	490
26......	3,200	737	7,220	1,120	3,760	682	523	709	601	1,280	482	530
27......	2,400	900	6,180	3,880	5,080	655	502	700	745	1,620	514	670
28......	1,600	1,240	5,320	1,480	3,440	610	546	700	1,300	1,770	466	620
29......	1,050	......	6,740	1,080	2,660	546	790	690	1,350	1,920	456	575
30......	800	......	8,650	5,020	2,320	495	745	664	1,040	1,800	458	548
31......	700	......	9,430	......	2,710	......	810	655	......	1,770	......	602
Mean...	1,130	677	4,19	3,560	2,380	1,840	508	956	986	1,130	806	473

NOTE.— Daily discharge during frozen periods determined on the basis of measurements made under ice conditions, climatological reports and of intercompárison with the discharge obtained at other stations. A well defined rating has been developed for open water period.
Mean for June may be low.

Monthly Discharge of Hudson River at North Creek, N. Y.
[Drainage area, 804 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1907.					
September	1,620	495	1,050	1.31	0.54
October	5,440	830	2,120	2.64	3.04
November	7,990	745	2,530	3.15	3.51
December	4,340	546	1,970	2.45	2.82
1908.					
January	3,060	781	(1,300)	1.62	1.87
February	4,030	880	(2,020)	2.51	2.71
March	6,590	1,420	(2,730)	3.40	3.92
April	14,200	2,220	5,270	6.55	7.31
May	10,800	1,540	5,230	6.50	7.49
June	1,770	442	818	1.02	1.14
July	1,520	418	830	1.03	1.19
August	900	602	742	0.923	1.06
September	709	467	525	0.653	0.73
October	664	436	532	0.662	0.76
November	1,300	442	626	0.779	0.87
December	851	360	(570)	0.709	0.82
The year	14,200	360	1,770	2.20	29.87
1909.					
January	1,290	338	(622)	0.774	0.89
February	2,500	500	(1,280)	1.59	1.66
March	2,300	800	(1,180)	1.47	1.70
April	13,600	1,290	6,290	7.82	8.72
May	14,700	1,380	5,150	6.41	7.39
June	2,430	430	1,360	1.69	1.89
July	1,380	310	679	0.845	0.97
August	980	272	773	0.961	1.11
September	910	718	807	1.00	1.12
October	880	530	717	0.892	1.03
November	1,160	570	737	0.917	1.02
December	640	277	(427)	0.531	0.61
The year	14,700	272	1,670	2.08	28.11
1910.					
January	5,400	275	1,130	1.40	1.61
February	1,290	600	677	0.842	0.88
March	9,430	1,600	4,190	5.21	6.00
April	9,790	628	3,560	4.43	4.94
May	5,080	810	2,380	2.96	3.41
June	3,660	495	1,840	2.29	2.56
July	810	295	508	0.632	0.73
August	2,240	610	956	1.19	1.37
September	1,650	646	986	1.23	1.37
October	1,920	554	1,130	1.41	1.63
November	1,550	330	806	1.00	1.12
December	670	350	473	0.588	0.68
The year	9,790	275	1,550	1.93	26.30

NOTE.— Owing to availability of more recent data, the 1907–1908 monthly estimates differ slightly from those published in the fourth annual report of the State Water Supply Commission of New York.

DRY RIVER.

DRY RIVER AT WATERVLIET, N. Y.

Four gages were erected on Dry river within the city limits of Watervliet in the spring of 1910. The gages are designated as gage No. 1, gage No. 2, gage No. 3 and gage No. 4. No. 1 is located near the corner of First avenue and 13th street; No. 2 is just above the entrance to the dive-culvert under the Erie canal near 13th street; No. 3 is on the arch culvert at 14th street, and No. 4 is located at 19th street. Gages Nos. 1, 2 and 4 are staff-gages and No. 3 is a box-gage. The gages were erected by J. P. Newton, March 1, 1910, and the zeros are referred to an arbitrary datum of 100.00.

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Dry River at Gage No. 1, 1st Ave., Watervliet, N. Y.

DAY.	Mar.	April.	May.	June.	July.
1910.					
1	97.15	90.28	89.52	90.45	90.50
2	98.22	90.20	89.65	90.58	90.60
3	98.05	90.25	89.62	90.45	90.71
4	96.50	90.15	89.68	90.50	90.60
5	94.90	90.18	89.40	90.78	90.51
6	92.70	90.22	89.38	90.80	90.34
7	92.60	90.42	89.30	90.78	90.55
8	92.85	90.22	89.30	90.65	......
9	90.92	90.18	89.52	90.60	......
10	90.62	90.10	89.52	90.65	......
11	90.65	90.18	89.42	90.78	......
12	90.66	90.25	89.58	90.90	......
13	91.00	90.12	89.45	90.68	......
14	90.45	90.00	89.32	90.60	......
15	90.12	90.08	89.38	90.78	......
16	90.10	90.18	89.25	90.59	......
17	90.05	90.38	89.50	90.62	......
18	90.08	90.20	89.98	90.76	......
19	90.05	90.08	89.95	90.85	......
20	90.31	90.08	89.98	90.65	......
21	90.30	90.00	89.72	90.68	......
22	90.22	89.85	89.65	90.60	......
23	90.18	89.70	89.35	90.72	......
24	90.18	89.78	90.40	90.58	......
25	90.04	90.10	90.55	90.70	......
26	90.15	90.38	90.60	90.59	......
27	90.35	89.85	90.58	90.55	......
28	90.32	89.68	90.65	90.38	......
29	90.06	89.48	90.55	90.38	......
30	90.10	89.38	90.78	90.54	......
31	90.15	89.52	90.62	......	......

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Dry River at Gage No. 2, above Canal Culvert, Watervliet, N. Y.

DAY.	Mar.	April.	May.	June.	July.
1910.					
1	......	92.16	92.40	92.46	92.42
2	98.23	92.16	92.56	92.28	92.34
3	98.10	92.15	92.51	92.28	92.48
4	96.45	92.13	92.34	92.26	92.40
5	94.81	92.16	92.31	92.56	92.24
6	92.84	92.25	92.26	92.61	92.11
7	92.84	92.38	92.28	92.58	92.33
8	93.17	92.34	92.34	92.41	......
9	92.22	92.26	92.51	92.36	......
10	92.18	92.16	92.48	92.40	......
11	92.18	92.20	92.42	92.54	......
12	92.32	92.28	92.36	92.56	......
13	92.31	92.20	92.34	92.44	......
14	92.25	92.16	92.27	92.41	......
15	92.18	92.28	92.28	92.54	......
16	92.22	92.24	92.28	92.36	......
17	92.18	92.24	92.26	92.36	......
18	92.28	92.24	92.46	92.64	......
19	92.36	92.48	92.51	92.74	......
20	92.36	92.44	92.38	92.48	......
21	92.34	92.31	92.26	92.38	......
22	92.26	92.16	92.29	92.30	......
23	92.24	92.21	92.24	92.35	......
24	92.18	92.21	92.26	92.30	......
25	92.16	92.36	92.31	92.40	......
26	92.14	92.44	92.36	92.36	......
27	92.18	92.26	92.34	92.18	......
28	92.16	92.18	92.41	92.18	......
29	92.16	92.21	92.31	92.14	......
30	92.14	92.24	92.48	92.24	......
31	92.15	92.40	92.41	......	......

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Dry River at Gage No. 3, 14th St., Watervliet, N. Y.

DAY.	Mar.	April.	May.	June.	July.
1910.					
1	......	95.66	96.10	95.88	95.68
2	95.61	95.58	96.36	95.92	95.67
3	95.39	95.66	96.23	95.80	95.66
4	94.21	95.43	96.40	95.86	95.65
5	94.21	95.70	96.16	95.76	95.62
6	94.21	95.80	96.13	96.38	95.62
7	94.52	96.48	96.00	96.18	95.68
8	95.36	96.26	96.06	96.00	......
9	95.46	96.06	96.36	95.88	......
10	95.21	95.96	96.40	95.90	......
11	94.99	96.06	96.30	96.28	......
12	95.01	96.20	96.23	96.08	......
13	95.53	96.00	96.16	96.00	......
14	95.43	95.90	96.08	95.89	......
15	95.21	96.00	96.10	95.76	......
16	94.86	96.00	96.00	95.83	......
17	94.86	95.96	95.90	95.88	......
18	94.81	96.10	96.03	96.23	......
19	95.63	96.30	96.00	96.28	......
20	96.03	96.16	95.80	96.14	......
21	96.18	96.10	95.73	95.93	......
22	95.98	96.06	95.56	95.82	......
23	95.98	95.96	95.63	95.74	......
24	95.90	95.96	95.63	95.70	......
25	96.00	96.30	95.63	95.68	......
26	95.90	96.68	95.83	95.66	......
27	95.83	96.13	95.60	95.67	......
28	96.06	96.06	95.63	95.97	......
29	96.00	95.93	95.56	95.74	......
30	95.66	95.90	95.96	95.70	......
31	95.68	......	96.18	......	......

Mean Daily Elevation of Water-surface (Barge Canal Datum) of Dry River at Gage No. 4, 19th St., Watervliet, N. Y.

DAY.	Mar.	April.	May.	June.	July.
1910.					
1	......	103.07	103.26	103.22	102.90
2	106.09	103.03	103.72	103.28	102.91
3	105.46	103.08	103.52	103.18	102.90
4	105.38	103.09	103.55	103.12	102.90
5	105.12	103.12	103.38	103.05	102.90
6	104.92	103.12	103.35	103.45	102.89
7	105.44	103.44	103.38	103.35	102.86
8	104.02	103.38	103.32	103.12	......
9	103.83	103.25	103.65	103.10	......
10	103.72	103.15	103.66	103.16	......
11	103.49	103.28	103.56	103.30	......
12	103.38	103.42	103.46	103.22	......
13	103.62	103.38	103.40	103.19	......
14	103.36	103.35	103.32	103.10	......
15	103.26	103.38	103.28	103.02	......
16	103.28	103.32	103.22	103.02	......
17	103.21	103.38	103.05	103.10	......
18	103.24	103.35	103.05	103.34	......
19	103.34	103.67	103.14	103.32	......
20	103.50	103.45	103.22	103.14	......
21	103.44	103.38	103.12	103.08	......
22	103.28	103.28	103.05	103.01	......
23	103.24	103.22	102.95	103.00	......
24	103.24	103.20	102.85	102.94	......
25	103.22	103.45	102.90	102.92	......
26	103.20	103.70	103.10	102.91	......
27	103.18	103.30	102.95	102.90	......
28	103.20	103.18	102.98	103.14	......
29	103.16	103.10	102.88	103.02	......
30	103.10	103.05	103.18	102.96	......
31	103.12	103.26	103.38	......	......

Current-meter Discharge Measurements of Dry River at Watervliet, N. Y.

DATE.	Hydrographer.	GAGE READING.			Meter No.	Submergence depth.	Area flowing.	Computed discharge.
		Beginning.	Ending.	Mean.				
1910.							*Square feet.*	*Second-feet.*
Mar. 24 *a*	A. R. Patchke	1.19	1.19	1.19	....	......	......	1.87
Mar. 8 *b*	N. B. Robbins	....	....	....	462	0.6	11.99	12.73

a Measurement taken by float at down-stream of culvert, 19th St. and 5th Ave.
b Current-meter measurements taken at 15th St.

HOOSIC RIVER.

DESCRIPTION.

Hoosic river has its sources on the west slope of the Hoosac mountains in Vermont and Massachusetts. Two head branches, one flowing southward, the other northward along the west slope of this range, unite at North Adams, Mass., and the stream then flows northwestward, entering the Hudson three miles north of

Mechanicville. Above Buskirk the drainage basin is rugged and precipitous, the distribution of tributaries affording rapid concentration of the run-off from the steep rock slopes. The ridges are sparsely wooded. The soil in the valleys is generally firm and tenacious. The general elevation of the valley at the junction of the head waters is 1,000 feet. Numerous dams, affording power for textile, agricultural implement, and other industries, are scattered throughout the length of the stream from North Adams to Schaghticoke. The drainage basin contains no important lakes and but little storage in reservoirs.

HOOSIC RIVER AT SCHAGTICOKE, N. Y.

The gaging records for this station have been furnished this Department by the Schenectady Power Co., which maintains the station in connection with its hydro-electric plant at Schaghticoke.

Mean Daily Discharge, Second-feet, of Hoosic River at Schaghticoke, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1	126	529	1,065	1,590	2,390	607	421	*155	130	217	254	......
2	220	653	909	1,645	*2,304	680	240	91	144	366	225	271
3	*164	704	1,244	1,745	2,446	380	416	137	160	*......	151	246
4	208	537	909	*1,665	3,242	555	*261	125	139	300	184	189
5	7,000	863	642	1,665	2,632	764	196	471	*91	260	194	*140
6	7,000	1,330	803	1,939	2,682	*683	......	563	113	284	157	206
7	4,000	*1,000	*704	5,416	2,514	660	334	170	......	173	*180	242
8	909	837	745	5,875	2,198	509	317	*78	180	177	179	255
9	909	582	660	2,985	2,205	555	264	217	68	100	226	203
10	*909	985	3,306	2,265	*1,697	647	......	263	222	*106	187	165
11	769	909	3,110	*1,564	1,529	684	*191	151	200	155	128	232
12	420	730	1,372	1,564	1,518	438	74	111	*63	117	211	*32
13	318	736	1,236	1,742	1,200	387	286	161	152	152	222	162
14	440	*876	*1,005	7,311	1,390	*552	241	170	170	61	*40	312
15	550	1,190	1,025	6,958	1,260	458	292	*73	117	163	154	540
16	540	1,275	911	3,982	*1,094	387	298	183	113	200	200	404
17	*347	1,355	873	5,374	1,387	516	237	388	149	*14	226	166
18	314	1,012	739	*3,255	1,415	2,137	*143	768	204	262	178	233
19	234	2,760	803	3,363	1,200	973	110	400	*39	197	135	115
20	430	17,190	736	3,922	1,081	*1,118	188	300	8	143	172	*161
21	421	*4,800	*612	2,540	950	564	124	300	129	236	*78	203
22	436	2,860	688	2,432	1,127	554	177	*65	156	231	......	231
23	200	2,300	627	3,024	*891	571	213	206	96	183	228	162
24	*7,200	5,647	614	2,724	1,125	448	217	176	236	*159	175	174
25	4,700	5,500	869	*1,577	815	473	*178	171	163	423	156	110
26	1,927	3,010	2,154	1,254	760	483	133	150	*60	292	265	*186
27	1,094	1,876	1,381	870	682	*136	213	207	301	289	148	127
28	761	*1,281	*2,150	2,454	740	452	194	186	1,296	194	*191	163
29	691	......	2,180	1,938	640	473	121	*43	734	328	263	148
30	628	......	1,514	2,233	*942	376	163	33	400	53	259	134
31	*553	......	1,395	......	691	......	233	178	......	*171	......	113
Mean	1,433	2,262	1,193	2,896	1,508	607	223	216	208	200	185	201

* Sunday.

Mean Daily Discharge, Second-feet, of Hoosic River at Schaghticoke, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	100	......	10,981	2,500	*775	1,932	312	69	46	57	127	266
2......	*200	630	6,047	2,129	1,157	1,203	386	115	57	*137	115	324
3......	77	439	2,436	*1,631	1,041	1,111	*221	173	162	23	173	254
4......	149	648	2,048	1,504	1,169	1,284	300	127	*115	23	381	*231
5......	170	385	2,206	1,227	1,111	*1,273	289	231	75	127	694	104
6......	1,400	*302	*2,505	1,400	1,319	1,168	104	208	115	127	*879	185
7......	1,206	300	3,622	1,388	567	1,793	231	*127	451	83	550	162
8......	926	415	3,240	1,157	*787	1,307	266	46	1,018	46	520	173
9......	*463	674	2,506	1,030	1,041	1,473	150	208	405	*89	381	138
10......	525	648	2,566	*1,157	1,057	1,284	*127	187	243	......	312	185
11......	453	556	1,736	1,000	698	1,493	162	104	*405	115	393	*127
12......	282	605	1,458	1,030	666	*1,504	254	231	104	92	486	81
13......	453	*302	*1,215	1,041	606	2,048	219	266	138	115	*289	......
14......	254	481	1,620	1,157	544	1,481	162	*219	254	104	428	173
15......	470	385	1,278	1,053	*469	1,203	173	128	162	90	358	127
16......	*114	672	1,189	613	479	1,053	277	150	104	*90	405	185
17......	200	567	1,210	*544	555	1,064	*104	34	150	......	312	185
18......	1,550	532	1,233	1,076	671	1,342	150	115	*104	92	277	*104
19......	1,470	611	1,040	1,169	775	*1,018	150	138	44	136	254	56
20......	960	*381	*894	1,180	625	1,006	196	150	115	69	*243	81
21......	3,163	2,027	1,418	1,040	717	659	162	*162	196	81	185	266
22......	12,520	2,700	1,412	862	*613	648	185	150	104	69	243	173
23......	*2,635	1,974	1,400	670	613	544	231	121	115	*115	243	162
24......	1,787	1,027	1,700	*451	567	463	*92	69	81	23	290	......
25......	1,331	1,134	1,689	728	983	482	173	115	*150	185	219	*1,111
26......	1,100	995	2,208	1,619	3,472	*162	127	104	57	138	254	1,400
27......	1,100	*7,305	*2,527	1,380	1,180	532	439	115	57	162	*231	451
28......	856	14,752	2,138	1,238	844	601	185	*115	185	92	104	625
29......	717	......	2,025	1,192	*648	509	173	29	185	115	279	636
30......	*578	......	1,782	1,100	2,893	381	138	92	138	*185	219	775
31......	868	......	2,257	......	2,743	......	*69	69	......	81	......	1,550
Mean...	1,228	1,535	2,309	1,176	1,012	1,067	200	134	184	99	328	355

* Sunday.

Monthly Discharge of Hoosic River at Schaghticoke, N. Y.

[Drainage area, 635 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1909.					
January	7,200	126	1,433	2.257	2.596
February	17,190	529	2,262	3.562	3.704
March	3,306	612	1,193	1.879	2.161
April	7,311	870	2,896	4.560	5.107
May	3,242	640	1,508	2.375	2.731
June	2,137	136	607	0.956	1.071
July	421	74	223	0.351	0.404
August	768	33	216	0.340	0.391
September	1,296	8	208	0.327	0.366
October	423	14	200	0.315	0.362
November	265	40	185	0.291	0.326
December	540	32	201	0.316	0.363
1910.					
January	12,520	77	1,228	1.934	2.224
Februray	14,752	300	1,535	2.417	2.514
March	10,981	894	2,309	3.636	4.181
April	2,500	451	1,176	1.851	2.073
May	3,472	469	1,012	1.594	1.833
June	2,048	162	1,067	1.680	1.882
July	439	69	200	0.315	0.362
August	266	34	134	0.211	0.243
September	1,018	44	184	0.290	0.324
October	185	23	99	0.156	0.180
November	879	104	328	0.517	0.577
December	1,550	81	355	0.559	0.644

HOOSIC RIVER AT JOHNSONVILLE, N. Y.

The Schenectady Power Co. maintains gaging records in connection with its hydro-electric plant at Johnsonville and has furnished this Department with the records for this station.

Means Daily Discharge, Second-feet, of Hoosic River at Johnsonville, N. Y.

DAY.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.								
1	1,500	400	379	*140	......	196	229	......
2	*1,600	600	216	83	......	330	230	244
3	2,300	350	375	124	144	*.....	136	222
4	2,800	500	*205	113	126	270	166	171
5	2,200	700	177	424	*82	234	175	*.....
6	1,600	*615	......	506	......	256	142	186
7	1,800	600	301	......	......	156	*162	215
8	1,650	450	286	*71	162	160	161	230
9	*1,400	500	238	196	62	90	203	187
10	1,200	583	......	237	200	*96	168	149
11	1,200	616	*.....	136	......	140	116	209
12	1,200	395	......	100	*57	106	190	*.....
13	950	*349	......	145	137	160	200	146
14	850	497	......	153	153	55	*36	281
15	840	413	263	*66	106	144	139	......
16	*840	349	269	165	102	180	180	364
17	1,000	465	214	350	135	*10	204	150
18	900	1,924	*129	692	184	206	156	210
19	800	876	99	360	*61	176	122	*104
20	750	*1,007	170	......	......	131	155	145
21	800	508	112	......	117	213	*71	210
22	850	450	160	*59	141	208	......	208
23	*600	514	192	......	......	165	206	146
24	640	404	196	159	213	*144	158	157
25	650	426	*161	154	147	381	141	......
26	500	435	120	135	*.....	270	239	*178
27	400	*123	192	187	264	261	134	115
28	400	407	175	168	1,287	175	*172	147
29	600	426	109	39	......	296	237	......
30	*600	339	147	*30	360	......	234	121
31	400	......	210	......	......	*154	......	102
Mean	1,091	541	204	192	202	185	168	184

* Sunday.

Mean Daily Discharge, Second-feet, of Hoosic River at Johnsonville, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	......	......	......	2,250	*698	1,734	281	60	42	52	115	240
2......	*180	567	......	1,917	1,042	1,083	343	104	52	*124	104	292
3......	70	396	2,193	*1,468	937	1,000	*199	156	146	21	156	229
4......	135	584	1,844	1,354	1,053	1,156	270	115	*104	21	343	*208
5......	153	347	1,986	1,105	1,000	*1,146	261	208	68	115	625	94
6......	1,260	*272	*2,255	1,260	1,188	1,052	94	188	104	115	*792	167
7......	1,086	270	3,260	1,250	528	1,614	208	*115	406	75	500	146
8......	836	374	2,916	1,042	*709	1,177	240	......	917	42	468	156
9......	*417	607	2,328	927	937	1,344	135	188	365	*81	343	125
10......	473	584	2,310	*1,042	952	1,156	*115	169	219	......	281	167
11......	408	501	1,563	900	584	1,344	146	94	*365	104	354	*115
12......	254	545	1,313	927	600	*1,354	229	208	94	83	436	73
13......	408	*272	*1,094	937	546	1,844	198	240	125	104	*261	......
14......	229	433	1,458	1,042	490	1,333	146	*198	229	94	386	156
15......	423	347	1,151	948	*423	1,083	156	116	146	81	323	115
16......	*103	605	1,071	552	432	948	250	135	94	*81	365	167
17......	......	511	1,089	*490	500	958	*94	31	135	......	281	167
18......	1,395	499	1,110	969	604	1,208	135	104	*94	83	250	*94
19......	1,323	550	936	1,053	698	*917	135	125	40	......	229	51
20......	864	*343	*805	1,062	563	906	177	135	104	63	*219	73
21......	2,823	1,825	1,277	986	646	594	146	*146	177	73	167	240
22......	11,268	2,430	1,270	796	*552	584	167	135	94	......	219	156
23......	*2,872	1,782	1,260	603	552	490	208	109	104	*104	219	142
24......	1,609	925	1,530	*406	511	417	*83	63	73	21	261	......
25......	1,198	1,021	1,521	665	885	438	156	104	*135	167	198	*1,000
26......	990	......	1,989	1,455	3,125	*146	115	94	52	125	229	1,260
27......	990	*6,575	*2,275	1,250	1,062	479	396	104	52	146	*208	406
28......	771	13,277	1,925	1,115	760	541	167	*104	167	83	94	563
29......	646	......	1,823	1,073	*584	454	156	27	167	104	250	573
30......	*521	......	1,604	990	2,604	343	125	83	125	*167	198	698
31......	782	......	2,032	......	2,469	......	*60	63	......	73	......	1,395
Mean...	1,189	1,402	1,696	1,061	911	961	180	124	166	89	296	320

* Sunday.

Monthly Discharge of Hoosic River at Johnsonville, N. Y.

[Drainage area, 609 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1909.					
May	2,800	400	1,091	1.791	2.060
June	1,924	123	541	0.888	0.995
July	379	99	204	0.335	0.385
August	692	30	192	0.315	0.362
September	1,287	57	202	0.331	0.371
October	381	10	185	0.304	0.350
November	239	36	168	0.276	0.309
December	364	102	184	0.302	0.347
1910.					
January	11,268	70	1,189	1.952	2.245
February	13,277	270	1,402	2.302	2.394
March	3,260	805	1,696	2.785	3.203
April	2,250	406	1,061	1.742	1.951
May	3,125	423	911	1.495	1.719
June	1,844	146	961	1.578	1.767
July	396	60	180	0.296	0.340
August	240	27	124	0.204	0.235
September	917	42	166	0.273	0.305
October	167	21	89	0.146	0.168
November	792	94	296	0.486	0.542
December	1,395	51	320	0.525	0.605

HOOSIC RIVER AT BUSKIRK, N. Y.

A gaging station was established September 25, 1903, at the highway bridge in Buskirk village by Robert E. Horton, for the U. S. Geological Survey, by which it was subsequently maintained in coöperation with this Department.

During 1908 the Schenectady Power Company constructed a dam at Johnsonville, about five miles down-stream from the Buskirk gage. This dam was put in operation early in 1909, causing back water at Buskirk, thus destroying the value of records at this station, which was, therefore, discontinued August 13, 1910, and the gage removed.

Current-meter Discharge Measurements of Hoosic River at Buskirk, N. Y.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Square feet.*	*Feet per second.*	*Feet.*	*Second-feet.*
1910. Aug. 1	J. J. Phelan	110	406	0.646	2.27	262

HOOSIC RIVER ABOVE EAGLE BRIDGE, N. Y.

August 13, 1910, a chain-gage was established on the left bank of Hoosic river about one mile up-stream from Eagle Bridge and one-half mile below the mouth of Walloomsac river. This gage was installed to replace the gaging station at Buskirk. The gage is of the chain-and-weight type and is supported by a cantilever arm 14 feet in length securely fastened to two trees a short distance back from the edge of the bank, which is about 12 feet above low water at this point. Length of chain and weight, 18.62 feet. The gage is referred to two bench-marks: No. 1, spike in blaze on up-stream side of walnut tree, 8 inches in diameter and about 10 feet down-stream from the gage, elevation 17.565; No. 2, spike in small elm stump, 2 feet high and 2 feet up-stream from gage, elevation 17.688. Both elevations are above zero of gage.

The dam of Walter A. Wood & Company, located at Hoosick Falls, about two miles up-stream from the gage, has considerable influence on the flow of the stream during low water. Walloomsac river, also slightly controlled by power developments, enters Hoosic river about 1½ miles below the dam at Hoosick Falls.

Discharge measurements during 1910 were made by wading, a short distance down-stream from the gage. High-water measurements can be made from the highway bridge at Eagle Bridge.

The channel is fairly straight for 900 to 1,000 feet up-stream from the gage and for about the same distance down-stream. The left bank, in general, is high and wooded, while the right bank is low and subject to overflows in high water. About 1,000 feet down-stream from the gage, the banks are high on both sides and seldom flooded, except during periods of extreme high water, usually caused by temporary ice jams at the railroad bridge about three-fourths mile down-stream.

Mean Daily Gage Height, in Feet, of Hoosic River above Eagle Bridge, N. Y.

DAY.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.					
1	......	6.9	7.05	6.9	7.5
2	......	6.88	6.75	6.88	7.32
3	......	6.95	6.95	7.3	7.45
4	......	6.95	7.0	8.65	7.25
5	......	6.95	6.95	8.5	7.4
6	......	7.4	7.05	8.28	7.4
7	......	9.15	7.02	7.95	7.4
8	......	7.95	6.98	7.7	7.45
9	......	7.5	6.9	7.62	7.45
10	......	7.38	7.2	7.7	7.45
11	......	7.2	7.05	7.95	7.45
12	......	7.3	6.95	7.45	7.5
13	7.28	7.25	7.12	7.52	7.85
14	6.8	7.1	6.95	7.8	8.35
15	7.02	7.25	6.85	7.8	8.2
16	7.0	7.2	6.85	7.75	8.5
17	7.0	7.2	6.95	7.68	8.5
18	7.05	6.98	6.95	7.55	8.2
19	7.15	7.05	6.9	7.58	8.1
20	6.85	7.15	6.95	7.5	8.3
21	6.7	7.08	6.85	7.52	8.3
22	7.0	6.92	6.75	7.45	8.1
23	6.95	6.85	6.98	7.65	8.0
24	6.85	6.8	6.95	7.28	8.85
25	7.05	6.75	7.0	7.45	10.88
26	6.85	7.0	7.1	7.5	9.55
27	6.8	7.2	7.05	7.2	9.5
28	6.7	7.25	7.1	7.65	9.15
29	6.85	7.25	7.35	7.58	9.35
30	6.78	7.0	7.1	7.28	10.75
31	6.9	......	7.1	......	9.65

NOTE.— Ice conditions, December 10 to 31, inclusive.

Current-meter Discharge Measurements of Hoosic River above Eagle Bridge, N. Y.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
1910.		*Feet.*	*Square feet.*	*Feet per second.*	*Feet.*	*Second feet.*
Aug. 2......	J. J. Phelan...........	112	224	1.17	a7.25	263
Aug. 10......	C. C. Covert..........	118	131	1.23	7.03	162
Dec. 20b.....	W. G. Hoyt..........	115	254	1.18	8.24	299

a Measurement made before new gage was installed; reference point questionable. b Complete ice cover.

BATTEN KILL.

BATTEN KILL AT BATTENVILLE, N. Y.

This temporary station was located at the covered highway bridge at Battenville, just below the mill of the Phœnix Paper Company, and about five miles from Greenwich. It was established September 24, 1908; discontinued December 12, 1908, and reëstablished July, 1909. A standard chain-gage was installed on the highway bridge October 23, 1910; length of chain and weight, 24.16 feet. On account of being unable to get an observer, very little data, other than the discharge measurements, are available.

The station was maintained to obtain data regarding the low-water flow of Batten kill.

Whitaker brook enters about 1½ miles above the station. Power is developed at a number of places on this river, the nearest being about 1,500 feet above the station. At East Greenwich, 3½ miles farther up, is another dam. Below, there are dams at Center Falls and Greenwich, 2½ and 5 miles distant, respectively.

Information in regard to this station is contained in the reports of the State Engineer and Surveyor, State of New York.

Current-meter Discharge Measurements of Battenkill River near Battenville, N. Y.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
1910.		*Feet.*	*Square feet.*	*Feet per second.*	*Feet.*	*Second-feet.*
Aug. 12......	J. J. Phelan...........	115	180	....	6.35	24.1
Oct. 23a......	J. J. Phelan...........	56	437	....	5.66	85.6

a Made at wading section.

SACANDAGA RIVER.

DESCRIPTION.

Sacandaga river is one of the larger tributaries of the upper Hudson. It drains extensive portions of the southeast slope of the Adirondack region as well as a portion of the plateau lying north of Mohawk river and south of the Adirondack mountains. The head waters of the stream arise in the slopes surrounding Lake Pleasant, Sacandaga and Piseco lakes. Above Northville the drainage basin is rugged and almost completely forest-covered. From Northville to Conklinville the stream winds through a sandy valley flanked by steep slopes. The width of this valley averages about one mile from Northampton to Conklinville. Above Northampton is an extensive flat lying at elevation of about 740 feet. This flat is drained by Mayville, Vly and Hann's creeks, and contains extensive swamp areas. From Northville to Conklinville, a distance along the general course of the stream of about 22 miles, there is very little fall. The elevation at Conklinville is about 720 feet. Sacandaga river enters Hudson river at Luzerne at elevation about 540 feet. The distance from Conklinville to Luzerne is about seven miles along the general course of the stream.

SACANDAGA RIVER NEAR HADLEY, N. Y.

This station is located at the steel highway bridge about 2½ miles west of Hadley. It was established September 13, 1907, by the N. Y. State Water Supply Commission in coöperation with the U. S. Geological Survey, to obtain general and statistical data regarding the flow of the Sacandaga river, which has important storage and power possibilities.

The nearest dam is at Conklingville, about 3½ miles up-stream and is partially washed away and not used at present. Occcasional log jams occur in the vicinity of this station, causing backwater. The discharge is somewhat affected by ice during the winter months.

The datum of the chain gage attached to the bridge has remained the same during the maintenance of the station. Conditions for making accurate discharge measurements are fair, except during the existence of log jams. The rating curve is fairly well developed. Discharge measurements are made from the bridge.

Information in regard to this station is contained in the annual reports of the U. S. Geological Survey.

Current-meter Discharge Measurements of Sacandaga River near Hadley, N. Y.

DATE.	Hydrographer.	Mean gage reading.	Total area.	Total width.	Corrected discharge.
			Square feet.	*Feet.*	*Second-feet.*
1909.					
Jan. 19*a*	C. R. Adams	7.18	575	98	913
Feb. 8*b-c*	C. R. Adams	7.35	815	118	3,350
March 1 *c*	D. M. Wood	7.30	1,820	288	7,230
March 26 *c-d*	C. C. Covert	3.70	868	129	3,378
April 15	C. C. Covert	6.45	1,470	274	14,900
April 17	E. F. Weeks	7.46	1,789	285	15,500
April 19	E. F. Weeks	6.55	1,520	289	19,720
May 8	E. F. Weeks	4.70	1,000	282	7,680
May 10	E. F. Weeks	4.62	986	282	6,740
May 20	C. C. Covert	4.45	954	254	5,880
June 17*b*	C. C. Covert	2.90	715	121	1,770
July 21*b*	W. G. Hoyt	1.50	482	99	365
July 21*b*	W. G. Hoyt	1.50	468	96	355
Sept. 24*b*	W. G. Hoyt	1.20	213	92	237
Dec. 13*b-e*	Hoyt and James	2.59	565	123	407

a Measurement made under partial ice cover, about 15 feet wide along shore; very little flow under ice.
b Measurement made at lower bridge; all others in 1909 at upper highway bridge.
c Measurement greatly affected by ice and logs.
d Discharge slightly affected by log jam.
e Measurement made under partial ice cover, about 40 feet wide along shore; large amount of slush ice running.

Current-meter Discharge Measurements of Sacandaga River near Hadley, N. Y.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Square feet.*	*Feet per second.*	*Feet.*	*Second feet.*
1910.						
Jan. 21	W. G. Hoyt	207	1,340	.54	3.92	*a* 716
Mar. 5	C. C. Covert	282	1,250	8.98	5.65	11,200
Mar. 6	C. C. Covert	274	1,190	8.20	5.50	9,740
Mar. 31	W. G. Hoyt	286	1,420	10.20	6.15	14,500
April 5	W. G. Hoyt	285	1,020	7.68	4.68	7,840
Oct. 2	J. J. Phelan	254	383	3.45	2.62	1,320

a Measurement made through ice about one mile below second bridge. Average thickness, 1.40 feet.

Mean Daily Discharge, Second-feet, of Sacandaga River near Hadley, N. Y.

DATE.	Sept.	Oct.	Nov.	Dec.
1907.				
1	....	1,900	5,880	1,030
2	....	1,520	5,200	970
3	....	1,160	5,880	970
4	....	1,030	8,160	915
5	....	1,900	9,300	860
6	....	2,130	7,890	810
7	....	1,800	8,720	760
8	....	1,900	9,010	810
9	....	4,360	15,300	970
10	....	4,560	13,500	1,290
11	....	4,360	9,900	4,770
12	....	3,980	8,440	9,300
13	1,610	3,620	7,360	8,440
14	1,360	2,520	5,650	6,360
15	915	2,020	4,770	4,360
16	715	1,800	4,360	3,450
17	630	1,610	3,280	2,810
18	520	1,360	2,130	2,520
19	490	1,090	1,700	2,130
20	460	1,030	1,610	1,900
21	430	1,030	1,360	1,800
22	400	915	1,440	1,700
23	430	915	1,520	2,260
24	490	860	1,610	3,620
25	590	810	1,520	4,980
26	715	760	1,360	5,880
27	670	760	1,290	6,600
28	630	1,900	1,220	5,650
29	670	7,100	1,160	5,880
30	1,360	7,890	1,090	6,850
31	....	7,620	....	7,620
Mean	727	2,460	5,050	3,490

Mean Daily Discharge, Second-feet, of Sacandaga River near Hadley, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
1	7,620	(800)	1,800	17,200	21,100	......	388	272	182	345	545	775
2	7,100	(800)	1,520	15,000	20,300	......	365	240	170	410	640	775
3	6,600	(800)	1,520	12,500	19,900	......	365	210	158	410	575	705
4	4,980	(800)	1,440	10,200	19,100	......	345	210	158	365	575	640
5	4,170	(800)	1,360	8,440	18,400	......	365	225	145	345	488	545
6	2,960	(800)	1,290	7,360	18,000	......	345	240	145	308	410	460
7	2,260	(800)	1,220	7,890	16,800	......	365	272	135	308	365	488
8	1,800	(800)	1,090	10,500	15,700	......	365	290	135	290	345	575
9	1,610	(800)	970	13,200	14,200	......	388	308	135	255	345	640
10	1,520	(800)	860	14,200	13,200	......	365	308	135	210	365	640
11	1,360	(800)	1,160	15,300	12,200	......	345	272	135	182	388	705
12	1,360	(800)	1,520	15,700	11,200	......	325	255	135	272	410	812
13	1,520	(800)	2,260	16,800	10,800	......	308	240	135	272	460	921
14	1,700	(800)	3,120	18,000	9,900	......	290	240	125	325	488	902
15	1,520	(5,000)	3,620	17,600	9,010	......	272	210	125	325	515	799
16	1,360	(25,000)	3,800	16,800	8,160	......	272	210	125	255	515	782
17	1,290	9,900	3,980	15,000	6,850	......	290	210	115	240	488	698
18	1,220	9,010	3,620	13,900	6,120	......	345	225	115	240	488	682
19	1,160	8,440	3,280	11,800	5,420	......	488	240	115	225	460	606
20	1,090	7,360	3,120	10,200	4,980	......	640	255	115	225	460	592
21	1,030	6,360	2,960	7,890	4,360	......	640	240	115	210	460	578
22	970	5,420	3,280	8,440	4,170	......	575	225	115	210	460	592
23	915	4,770	3,280	10,500	3,980	......	545	210	115	210	488	597
24	860	4,170	3,800	13,200	(3,500)	......	435	210	115	195	515	574
25	800	3,620	4,560	15,700	(3,500)	435	388	210	115	195	575	577
26	760	3,120	5,420	16,800	(3,500)	460	345	210	115	210	640	578
27	670	2,520	6,360	18,000	(3,500)	488	345	210	115	471	705	553
28	810	2,390	8,160	20,700	(3,500)	435	345	195	115	850	775	527
29	800	2,020	11,500	21,800	(3,500)	410	365	195	225	940	850	502
30	(800)*a*	......	16,400	21,800	(3,500)	388	325	195	272	988	850	485
31	(800)	......	19,500	......	(3,500)	......	308	182	......	1,090	......	442
Mean	2,050	3,800	4,120	14,100	9,740	436	382	233	138	367	521	637

a Discharge estimated, Jan. 29 to Feb. 16.

NOTE.— During May, discharge has been roughly estimated.

Mean Daily Discharge, Second-feet, of Sacandaga River near Hadley, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1	450	1,800	7,220	4,460	9,320	1,920	448	340	210	315	315	670
2	450	1,600	4,560	4,770	9,100	1,880	400	315	195	290	315	670
3	450	1,500	3,480	5,090	8,470	1,710	448	290	195	270	290	630
4	450	1,400	3,490	5,350	8,470	1,570	460	290	180	270	290	534
5	600	1,300	1,800	6,110	8,050	1,570	430	270	180	250	270	520
6	4,000	1,200	1,660	7,240	8,050	1,660	400	250	180	250	258	520
7	4,500	1,200	1,660	8,890	7,680	1,740	370	230	180	230	250	490
8	3,250	3,350	1,670	10,600	7,640	1,780	340	210	195	230	290	460
9	2,500	2,950	1,660	12,500	7,280	1,880	340	210	195	210	290	430
10	2,000	2,500	1,580	13,600	6,930	1,920	315	195	210	210	290	430
11	1,750	3,000	1,500	12,700	7,240	3,060	290	186	210	210	315	400
12	1,600	2,850	1,440	13,800	7,840	2,160	270	180	210	230	315	400
13	1,400	2,950	2,500	15,400	9,750	2,340	270	180	210	230	315	420
14	1,250	2,250	1,300	16,800	9,100	2,230	270	165	230	230	290	420
15	1,130	2,600	1,270	18,300	8,260	2,080	290	165	230	250	290	420
16	1,050	2,500	1,170	19,200	7,640	1,780	290	195	230	250	290	420
17	980	2,350	1,100	19,700	7,280	1,740	315	315	230	258	290	420
18	930	2,200	1,020	18,000	7,160	1,830	315	815	230	270	315	420
19	910	2,200	984	17,100	6,290	1,960	340	990	210	290	340	420
20	900	6,000	932	16,400	5,940	2,120	340	815	195	290	388	420
21	900	9,000	983	15,600	5,260	2,460	330	630	180	315	400	420
22	900	7,600	1,000	15,000	4,460	1,710	315	576	165	340	430	420
23	900	6,000	1,220	13,600	3,930	1,340	340	520	186	388	460	420
24	900	5,000	1,540	12,700	3,870	1,090	388	472	210	490	490	420
25	2,160	10,000	2,330	12,200	3,590	966	490	448	230	490	534	420
26	2,930	8,000	3,380	11,900	3,370	815	576	388	230	460	606	420
27	3,000	7,000	3,380	11,300	3,010	742	590	315	250	430	670	420
28	2,800	6,710	3,220	11,000	2,760	654	534	258	282	412	670	420
29	2,600	.....	3,300	10,400	2,520	570	472	250	315	370	670	420
30	2,300	.....	3,580	9,750	2,300	508	388	230	340	340	670	420
31	2,000	.....	3,870	.....	2,120	...	340	218	......	315	......	420

Mean Daily Discharge, Second-feet, of Sacandaga River near Hadley, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1910.											
1	300	1,200	22,000	15,000	4,930	3,930	606	340	250	1,830	966
2	300	1,200	20,000	15,200	4,710	3,340	531	370	300	1,490	894
3	300	1,200	15,000	14,000	4,160	3,320	520	388	330	1,190	782
4	300	1,200	12,000	11,100	4,220	3,010	490	400	340	930	1,060
5	300	1,200	11,700	8,050	4,160	2,940	460	630	412	815	1,570
6	300	1,200	10,400	6,660	4,710	4,620	412	815	490	654	2,020
7	300	1,000	8,890	6,290	4,310	7,040	400	990	630	606	2,300
8	300	1,000	7,840	5,760	4,220	5,770	370	715	670	590	2,120
9	300	1,000	7,240	5,420	3,930	6,850	340	576	576	555	1,880
10	300	1,000	7,040	5,260	3,160	6,110	340	520	508	584	1,740
11	300	1,000	6,660	4,020	2,860	6,180	340	490	490	520	1,540
12	300	1,000	6,110	3,460	2,760	5,940	315	715	460	508	1,410
13	300	975	5,590	3,270	2,230	6,110	315	630	412	490	1,340
14	300	975	5,420	3,060	2,160	5,760	290	490	448	508	1,260
15	300	975	5,090	2,690	1,960	5,090	290	460	534	490	1,230
16	300	975	4,770	2,230	1,920	4,020	290	448	508	460	1,150
17	300	975	4,460	2,020	1,740	3,370	300	412	472	430	1,090
18	400	975	4,060	3,590	1,830	3,620	340	480	448	430	966
19	600	975	3,500	5,420	1,570	3,400	330	460	412	400	870
20	700	975	2,690	6,180	1,710	3,370	290	490	388	400	815
21	716	1,000	2,230	6,470	2,020	3,010	290	460	352	370	760
22	7,000	1,100	3,060	5,940	2,230	2,460	300	400	340	388	742
23	10,000	1,200	4,060	5,260	2,860	1,960	300	388	315	460	688
24	6,000	1,300	5,260	4,620	2,940	1,660	290	352	290	508	654
25	4,000	1,400	6,470	4,400	3,370	1,230	290	340	340	576	590
26	3,000	1,500	7,840	4,520	5,260	930	290	315	388	606	654
27	2,000	1,750	9,960	5,090	6,470	848	315	290	490	654	670
28	1,500	15,000	10,800	5,940	5,690	782	340	290	1,830	715	715
29	1,500	......	11,700	5,940	5,830	715	370	290	2,570	1,120	688
30	1,200	......	12,700	5,160	4,930	670	400	270	2,340	1,260	670
31	1,200	......	13,600	......	4,310	......	352	258	......	1,090	......
Mean	1,450	1,620	8,330	6,070	3,540	3,640	358	465	611	696	1,130

Note.— Backwater and ice conditions, January 1 to March 4, *inclusive*.

Monthly Discharge of Sacandaga River near Hadley, N. Y.
[Drainage area, 1,050 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1907.					
September 13-30	1,660	400	736	0.701	0.47
October	6,290	760	2,260	2.15	2.48
November	11,100	1,120	4,160	3.96	4.42
December	7,240	760	3,040	2.90	3.34
1908.					
January	6,110	670	(1,900)	1.81	2.09
February	*a*25,000	....	(3,420)	3.26	3.52
March	13,600	870	(3,480)	3.31	3.82
April	15,000	5,940	10,200	9.71	10.83
May	14,500	....	7,440	7.09	8.17
June	....	388	1,300	1.24	1.38
July	640	272	382	0.364	0.42
August	308	182	233	0.222	0.26
September	272	115	138	0.131	0.15
October	1,090	182	367	0.350	0.40
November	850	345	521	0.496	0.55
December	921	442	(637)	0.607	0.70
The year	25,000	115	2,500	2.38	32.29
1909.					
January	4,500	450	(1,680)	1.60	1.84
February	10,000	1,200	(3,820)	3.64	3.79
March	7,220	932	(2,250)	2.14	2.47
April	19,700	4,460	12,300	11.7	13.05
May	9,750	2,120	6,280	5.98	6.89
June	3,060	508	1,660	1.58	1.76
July	590	270	378	0.360	0.42
August	990	165	352	0.335	0.39
September	340	165	216	0.206	0.23
October	490	210	303	0.289	0.33
November	670	250	387	0.369	0.41
December	680	400	(456)	0.434	0.50
The year	19,700	165	2,510	2.39	32.08
1910.					
January	10,000	300	1,450	(1.38)	(1.59)
February	15,000	975	1,620	(1.54)	(1.60)
March	22,000	2,230	8,330	(7.93)	(9.14)
April	15,200	2,020	6,070	5.78	6.45
May	6,470	1,570	3,540	3.37	3.88
June	7,040	670	3,640	3.47	3.87
July	606	290	358	0.341	0.39
August	990	258	465	0.443	0.51
September	2,570	250	611	0.582	0.65
October	1,830	370	696	0.663	0.76
November	2,300	590	1,130	1.08	1.20

a Estimated.

NOTE.— Monthly estimates for 1907 and 1908 have been revised on the basis of additional data and differ slightly from those published in the fourth annual report of the State Water Supply Commission of New York.

SACANDAGA RIVER CABLE STATION, NEAR HADLEY, N. Y.

This station is located on the Sacandaga river about 1 mile above the mouth of the stream and 6 miles by river below the proposed dam at Conklingville. It was established November 12, 1910, to obtain data applicable to the proposed storage on this stream.

The river channel at this point was cleared of boulders to make the cross-section comparatively smooth and permanent, and a ⅝-inch galvanized wire rope, from which discharge measurements are made, was stretched across the stream.

About 30 feet down-stream from the cable and on the left bank, a concrete well was built, 3 feet square, inside dimensions. The bottom of the well is about 2 feet below low water and 12 feet below ground surface; it is connected with the river by a 4-inch cast iron water pipe, 48 feet in length, having its intake end pointing down-stream and protected by a fine wire screen. Inside of the well and securely bolted to the side is a bed plank, to which is fastened a staff gage with its zero at elevation 573.36, referred to a U. S. Geological Survey aluminum tablet set in the foundation wall of the Union Bag and Paper Company's mill at Hadley. On top of the well is a concrete shelter 6 feet high and 3 feet square, inside dimensions, for protecting the recording gage.

Current-meter Discharge Measurements of Sacandaga River at Cable Station near Hadley, N. Y

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
1910.		*Feet.*	*Square feet.*	*Feet per second.*	*Feet.*	*Second-feet.*
Oct. 28......	J. J. Phelan..................	215	453	2.11	3.80	948
Oct. 30......	J. J. Phelan..................	215	499	2.36	4.10	1,190
Oct. 31......	J. J. Phelan..................	215	457	2.26	3.90	1,030
Nov. 2......	J. J. Phelan..................	213	446	1.82	3.70	806
Nov. 12......	F. J. Shuttleworth...........	218	592	2.43	4.12	1,440
Dec. 1......	J. J. Phelan..................	210	399	1.58	3.43	632

This gaging station is maintained by the U. S. Geological Survey in coöperation with the N. Y. State Water Supply Commission.

SACANDAGA RIVER AT NORTHVILLE, N. Y.

This station is located about three-quarters mile up-stream from the steel highway bridge at Northville and was established August 26, 1907. It has been maintained by the N. Y. State Water Supply Commission in coöperation with the U. S. Geological Survey, to obtain general statistical and comparative data regarding the flow of the Sacandaga.

This station is located about 1 mile below the outlet of East Stony creek and about 2 miles below West Stony creek. It is about 1¼ miles above a low storage dam at Sacandaga park in Northville. Pondage from this dam extends to the highway bridge at certain stages.

The datum of the gage has remained the same during the maintenance of the station. The U. S. Weather Bureau maintains a river and flood station at the steel highway bridge. During the winter months the discharge is usually affected by the presence of ice to such an extent that gage readings are discontinued. Conditions for obtaining accurate discharge data for the remainder of the year are very good and an excellent rating curve has been developed.

Current-meter Discharge Measurements of Sacandaga River at Northville, N. Y.

DATE.	Hydrographer.	Mean gage reading.	Total area.	Total width.	Corrected discharge.
1907.			*Square feet.*	*Feet.*	*Second-feet.*
Aug. 24[a]...	Barrows and Hoyt...............	0.86	57.1	55	76.9
Aug. 24[a]...	Barrows and Hoyt...............	0.86	57.5	55	76.0
Sept. 25....	Pierson...........................	2.03	956.0	260	603
Sept. 27....	Pierson...........................	1.92	930	260	466
Oct. 8[b]...	Pierson...........................	3.89	1,340	274	3,310
Oct. 18....	Pierson...........................	2.58	1,000	264	1,020
Oct. 22....	Pierson...........................	2.31	855	262	868
Nov. 7[c]...	Pierson...........................	9.68	2,570	284	18,300
Nov. 9....	Pierson...........................	5.81	1,420	277	6,310
Nov. 20....	Pierson...........................	2.78	953	264	1,360
Nov. 22....	Pierson...........................	2.98	958	266	1,410
Dec. 21[d]...	Wood and Pierson..............	7.28	1,490	180	1,200
1908.					
Jan. 1....	Pierson...........................	4.54	1,300	273	3,350
June 25[e]...	Wood.............................	1.45	644	259	284
July 2[f]...	Wood and Brett.................	1.25	146	93	191
Sept. 15[f]...	Wood.............................	0.66	48.6	41.5	42.2
Sept. 15[f]...	Wood.............................	0.66	41.0	41.0	38.9
1909.					
Feb. 11[g]...	C. R. Adams.....................	6.80	1,120	250	2,330
Feb. 27[h]...	D. M. Wood.....................	8.33	1,900	225	4,740
April 16[i]...	C. C. Covert.....................	7.95	2,180	284	12,200
April 17[i]...	C. C. Covert.....................	7.70	2,180	270	11,600

[a] Gaging made by wading, about ¼ mile above staff gage.

[b] River rose 1.02 feet during gaging; result approximate only.

[c] Gaging by surface floats near Northville bridge.

[d] River frozen and gorged with anchor ice from a point ¼ mile up-stream from gage to dam, about 2 miles down-stream. Gage height is to water-surface, but is not a true index of flow; gage height to top of ice, about 7.33; ice about 0.2 feet thick. Gaging made from highway bridge at Northville, considerable needle ice. Result approximate only.

[e] Considerable doubt as to correct gage height. Meter was also found to be poor, afterward.

[f] Measurement by wading about 800 feet above gage.

[g] Measurement made under complete ice cover; average ice thickness, 1.90 feet; gage height to top of ice, 6.9 feet.

[h] Measurement made under complete ice cover; average ice thickness, 2.10; gage height to top of ice, 8.43 feet. Anchor ice running.

[i] Measurement made from highway bridge.

Current-meter Discharge Measurements of Sacandaga River at Northville, N. Y.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Square feet.*	*Feet per second.*	*Feet.*	*Second-feet.*
1910.						
Jan. 11......	C. C. Covert................	117	188	1.36	*2.35	[a] 255
Mar. 26......	W. G. Hoyt................	289	2,350	5.70	*7.88	13,400
Mar. 28......	W. G. Hoyt................	287	1,730	4.14	*6.14	7,170
Mar. 29......	W. G. Hoyt................	280	1,900	5.04	*7.14	9,570
April 12......	E. H. Sargent.............	280	1,910	4.74	*6.94	9,050
April 14......	W. G. Hoyt................	277	968	1.52	*2.84	1,470
June 7......	W. G. Hoyt................	284	1,790	3.69	*5.90	6,610
June 8......	W. G. Hoyt................	282	1,600	3.21	*5.26	5,140
July 18......	J. J. Phelan................	266	784	.32	*1.20	247
Aug. 26......	J. J. Phelan................	85.6	143	2.08	*1.42	[b] 298
Oct. 28......	W. G. Hoyt................	270	914	1.43	*2.74	1,310

* Corrected gage heights; 0.74 feet has been added to conform with original gage datum.

[a] Measurement made about 1,000 feet above gage, under complete ice cover; ice at gage, 1.95 feet thick.

[b] Measurement made at wading section.

Mean Daily Discharge, Second-feet, of Sacandaga River at Northville, N. Y.

DAY.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.					
1........	......	74	1,380	2,340	862
2........	......	74	862	1,980	880
3........	......	92	640	(7,000)	826
4........	......	267	727	(5,830)	790
5........	......	500	1,920	4,580	(790)[e]
6........	......	640	1,320	3,990	(780)[e]
7........	......	465	1,060	18,900	(770)[e]
8........	......	452	1,980	14,300	(760)[e]
9........	......	254	(5,830)	6,650	(750)[e]
10........	......	521	3,220	4,740	6,700
11........	......	452	2,410	3,950	7,740
12........	......	2,070	3,220	3,220	4,740
13........	......	1,180	2,640	2,350	3,050
14........	......	772	2,120	2,350	2,880
15........	......	535	1,730	1,960	(2,600)[e]
16........	......	465	1,380	1,560	(2,400)[e]
17........	......	388	1,210	1,470	(2,200)[e]
18........	......	290	1,080	1,360	(1,900)[e]
19........	......	254	960	1,340	(1,700)[e]
20........	......	237	880	1,250	(1,400)[e]
21........	......	258	862	1,270	1,200
22........	......	272	817	1,470	(1,200)[e]
23........	......	237	727	2,090	(2,000)[e]
24........	76	330	687	1,370	11,500
25........	76	559	640	1,360	8,280
26........	76	521	599	1,290	4,140
27........	79	400	583	1,180	3,220
28........	79	340	(7,000)	1,120	3,050
29........	79	420	(5,830)	1,140	5,190
30........	73	1,960	4,540	960	4,980
31........	74	......	3,050	......	7,660
Mean........	......	509	2,000	3,480	3,130

NOTE.— Parentheses denote interpolated values.

[e] Anchor ice accumulated down-stream, causing backwater on gage; discharge assumed.

Mean Daily Discharge, Second-feet, of Sacandaga River at Northville, N. Y

DAY.	Jan.*a*	Feb.*a*	Mar.*a*	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
1					17,300	3,080	205	140	65	191	281	507
2					16,400	1,880	188	290	61	191	209	548
3					13,100	1,910	177	188	61	229	209	*a*
4					9,780	2,010	177	112	65	164	191	
5					7,660	1,880	170	290	65	134	174	
6				3,250	6,400	2,290	177	155	56	129	158	
7					7,210	1,880	188	188	61	174	174	
8				4,780	7,050	832	245	183	61	102	184	
9				13,200	8,910	534	254	170	58	102	167	
10				9,840	6,560	604	198	146	56	102	164	
11					5,850	576	177	140	49	129	158	
12					7,050	455	170	146	49	229	494	
13					4,780	425	112	140	49	191	494	
14					5,870	368	425	290	49	158	373	
15					7,470	395	140	112	41	129	346	
16					6,800	1,040	188	100	41	129	272	
17				5,610	4,780	534	188	100	41	112	295	
18					4,580	425	281	281	41	102	295	
19					6,050	340	799	149	41	102	272	
20					5,400	815	520	180	36	102	295	
21					3,610	604	320	140	36	90	295	
22					4,480	555	340	100	36	90	320	
23					4,030	468	315	94	36	90	384	
24					3,800	443	245	107	41	80	330	
25					2,910	351	213	100	41	102	494	
26				13,300	2,750	290	245	65	41	102	1,000	
27				19,400	2,360	245	225	76	41	527	1,170	
28				16,400	1,650	225	198	72	41	632	866	
29				14,900	2,910	213	315	72	229	783	639	
30				16,500	2,750	205	205	65	330	632	954	
31					3,430		198	65		431		
Mean					6,250	862	252	144	63.9	208	389	

a Ice obstructions.

Mean Daily Discharge, Second-feet, of Sacandaga River at Northville, N. Y.

DAY.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1909.								
1	3,900	5,950	1,400	245	112	83	112	140
2	3,860	7,760	1,340	245	100	69	107	155
3	4,130	5,730	1,100	281	112	65	112	188
4	4,040	6,700	1,040	315	92	65	92	170
5	3,520	5,620	1,040	254	87	76	87	140
6	4,600	5,620	2,910	213	87	83	90	140
7	11,200	5,370	2,120	205	100	83	107	112
8	15,200	5,160	1,630	213	92	65	83	134
9	11,200	4,220	1,290	155	83	65	100	140
10	9,350	5,160	1,080	140	69	69	83	155
11	5,520	10,200	2,440	140	65	87	69	146
12	4,080	8,010	1,980	140	87	65	76	140
13	5,410	5,880	1,490	425	65	65	87	140
14	20,500	5,100	2,120	112	61	61	90	140
15	21,100	3,900	1,730	112	47	65	87	140
16	14,300	3,720	1,400	146	76	76	83	140
17	11,500	4,180	900	146	883	65	140	140
18	11,200	3,720	1,730	407	590	61	170	155
19	11,600	3,360	1,940	140	660	56	158	170
20	21,500	3,360	1,630	112	395	61	158	205
21	11,100	2,890	1,290	290	290	51	140	225
22	11,600	2,440	832	140	213	32	330	245
23	10,100	2,150	735	140	170	47	290	250
24	7,710	1,910	660	455	164	87	315	250
25	7,270	1,820	990	395	290	83	315	250
26	6,750	1,750	590	300	425	65	290	250
27	6,020	1,510	468	245	112	65	281	250
28	5,800	1,820	425	170	112	188	254	250
29	5,520	1,910	368	155	61	112	205	250
30	6,750	2,150	315	290	76	140	188	250
31		1,820		290	87		155	

NOTE.— Daily discharge based on a well-defined rating.

Mean Daily Discharge, Second-feet, of Sacandaga River at Northville, N. Y.

DAY.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.
1910.									
1	......	11,200	4,390	2,450	360	400	326	2,620	1,090
2	......	10,400	3,090	2,760	326	412	307	2,480	1,140
3	......	7,050	3,280	2,480	326	424	412	1,650	1,070
4	......	5,710	4,960	2,620	326	412	424	1,300	424
5	......	6,800	4,720	2,760	291	370	412	1,740	360
6	......	6,010	3,500	6,620	223	284	454	1,300	412
7	......	7,080	2,730	5,160	226	291	424	1,040	424
8	......	4,570	2,620	4,660	307	307	412	488	578
9	......	3,700	2,170	4,210	235	370	370	1,300	562
10	......	3,210	1,820	3,180	229	424	326	1,420	488
11	......	2,840	1,670	3,060	223	901	291	1,300	424
12	......	1,670	1,480	3,370	214	546	275	1,480	412
13	......	1,530	1,300	2,620	220	424	259	1,300	424
14	......	1,410	1,390	1,930	205	488	284	1,330	742
15	......	1,360	1,390	1,830	191	406	291	1,390	709
16	......	1,300	1,320	2,000	200	395	275	1,280	709
17	......	1,410	1,070	2,170	214	370	326	1,250	794
18	......	4,480	1,190	2,270	205	346	294	1,220	811
19	......	6,840	1,330	2,340	200	395	253	1,170	855
20	2,620	6,400	1,650	1,650	197	370	200	1,190	726
21	2,340	4,450	2,340	1,300	200	360	223	1,300	709
22	2,760	2,840	2,270	1,090	205	326	229	1,540	684
23	3,530	2,550	2,200	829	214	259	326	2,620	726
24	4,390	4,570	1,800	684	220	259	330	2,570	709
25	9,750	5,960	1,930	643	226	259	297	2,450	667
26	11,900	3,180	6,070	602	214	278	2,340	2,480	684
27	7,440	4,660	5,750	562	220	266	3,030	2,550	643
28	7,200	5,900	4,000	523	412	275	3,030	2,490	635
29	11,300	4,520	2,480	436	291	259	2,720	2,450	602
30	12,300	(4,460)	3,060	424	235	214	2,480	1,930	643
31	14,100	......	2,620	......	223	275	......	1,280	.....
Mean	7,470	4,600	2,630	2,240	245	367	722	1,670	662

NOTE.— Record for June low; record for October high; due to errors in gage heights.

Monthly Discharge of Sacandaga River at Northville, N. Y.
[Drainage area, 740 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1907.*a*					
August 24–31	83	69	78.2	0.106	0.03
September	2,070	74	550	0.743	0.83
October	7,000	632	2,000	2.70	3.11
November	18,400	972	3,420	4.62	5.16
December	10,800	750	(3,050)	4.12	4.75
1908.*b*					
January	....	....	(1,430)	1.93	2.22
February	....	....	(2,660)	3.59	3.87
March	....	....	(2,880)	3.89	4.48
April	18,900	....	(9,600)	13.00	14.50
May	16,600	1,650	6,040	8.16	9.41
June	3,070	205	862	1.16	1.29
July	799	112	252	0.341	0.39
August	290	65	144	0.195	0.22
September	330	36	63.9	0.086	0.10
October	783	80	208	0.281	0.32
November	1,170	158	389	0.526	0.59
December	....	....	(446)	0.603	0.70
The year	18,900	36	2,080	2.81	38.09

For foot-notes see page 675.

Monthly Discharge of Sacandaga River at Northville, N. Y.—(Concluded).
[Drainage area, 740 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1909.*c*					
January	....	....	(1,130)	1.53	1.76
February	....	....	(2,650)	3.58	3.73
March	....	....	(1,580)	2.14	2.47
April	21,500	3,520	9,210	12.4	13.83
May	10,200	1,510	4,220	5.70	6.57
June	2,910	315	1,300	1.76	1.96
July	455	112	226	0.305	0.35
August	883	47	189	0.255	0.29
September	188	32	75.2	0.102	0.11
October	330	69	157	0.212	0.24
November	250	112	182	0.246	0.27
December	....	....	(250)	0.338	0.40
The year	21,500	32	1,760	2.38	31.98
1910.					
March, 20–31	14,100	2,340	7,470	10.09	4.50
April	11,200	1,300	4,600	6.22	6.94
May	6,070	1,070	2,630	3.55	4.09
June	6,620	424	2,240	3.03	3.38
July	412	191	245	0.331	0.38
August	901	214	367	0.496	0.57
September	3,060	200	722	0.976	1.09
October	2,620	488	1,670	2.26	2.61
November	1,140	360	662	0.895	1.00

a Discharge of December and of missing days of 1907 estimated on basis of Sacandaga at Hadley.

Discharge Dec. 5–9, 1907, 770 second-feet; discharge Dec. 15–23, 1907, 1,840 second-feet.

Estimates for 1907 have been revised and differ slightly from those published in the fourth annual report of the State Water Supply Commission of New York.

b Discharge Jan.-April, 1908, and Dec., 1908, estimated on basis of Sacandaga at Hadley.

Estimates for 1908 have been revised and differ slightly from those published in the fourth annual report of the State Water Supply Commission of New York.

c Monthly discharge for Jan., Feb., March and Dec., 1909, determined from discharge at Wells and Hadley.

SACANDAGA RIVER AT WELLS, N. Y.

This station is located at the steel highway bridge over the east branch of the Sacandaga river in the southern part of the village of Wells, about 2½ miles above the junction of the east and west branches. It was established August 26, 1907, by the N. Y. State Water Supply Commission in coöperation with the U. S. Geological Survey, to obtain general statistical and comparative data regarding the flow of the Sacandaga river.

The datum of the chain gage attached to the bridge has remained the same during the maintenance of the station. During the winter months the discharge is usually affected by the presence of ice. Conditions for obtaining accurate discharge data are good, and a fairly good rating curve has been developed. All measurements are made from the bridge.

Information in regard to this station is contained in the annual reports of the U. S. Geological Survey.

Current-meter Discharge Measurements of Sacandaga River at Wells, N. Y.

DATE.	Hydrographer.	Mean gage reading.	Total area.	Total width.	Corrected discharge.
1907.			*Square feet.*	*Feet.*	*Second-feet.*
Aug. 25[a]	Barrows and Hoyt	3.72	21.4	37.5	23
Aug. 26[b]	Barrows and Hoyt	3.72	47.4	50	26.8
Sept. 26	Pierson	4.40	145	66	178
Oct. 7	Pierson	4.84	172	67	318
Oct. 7	Pierson	4.84	166	67	284
Oct. 21	Pierson	4.85	170	67	335
Nov. 3[c]	Pierson	7.50	384	95	3,150
Nov. 21	Pierson	5.20	198	68	542
Dec. 18	Pierson	5.45	218	70	636
1908.					
Jan. 27[d]	D. M. Wood	4.64	168	67.5	290
June 26	D. M. Wood	4.25	110	67	115
Sept. 16[b]	D. M. Wood	3.50	24.8	36.5	11.7
1909.					
Jan. 23[e]	C. R. Adams	5.10	184	68	174
Feb. 10[f]	C. R. Adams	5.92	238	70	637
June 30	C. C. Covert	4.28	120	77	124
June 30	C. C. Covert	4.29	150	77	133

[a] Gaging by wading, about one mile up-stream from gage.

[b] Gaging by wading, about 800 feet up-stream from gage.

[c] Gaging by surface floats near bridge.

[d] Poor measurement; anchor ice.

[e] River obstructed by ice; partial ice cover; average thickness of ice, 0.6 foot; gage height to top of ice, 5.2 feet.

[f] Discharge affected by ice conditions.

Current-meter Discharge Measurements of Sacandaga River at Wells, N. Y.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
1910.		*Feet.*	*Square feet.*	*Feet per second.*	*Feet.*	*Second-feet.*
Jan. 9	C. C. Covert	46	95	.71	4.24	[a]68
Jan. 10	C. C. Covert	46	92	.70	4.26	[a]64
Mar. 26	W. G. Hoyt	100	530	7.24	8.5	[b]3,840
Mar. 27	W. G. Hoyt	98	438	6.44	7.58	2,820
Mar. 28	W. G. Hoyt	98	428	6.66	7.55	2,850
Mar. 29	W. G. Hoyt	97	530	7.04	8.5	[b]3,730
April 13	C. C. Covert	90	404	3.56	7.26	[c]1,440
April 14	C. C. Covert	82	258	1.95	5.62	[c] 503
June 8	W. G. Hoyt	91	351	4.79	6.54	1,680
June 9	W. G. Hoyt	89	319	4.36	6.30	1,390
July 15	J. J. Phelan	55	111	.49	3.90	55
July 21	J. J. Phelan	56	129	1.15	4.39	148
Oct. 27	W. G. Hoyt	73	172	1.44	4.75	248
Oct. 27	W. G. Hoyt	82	242	2.53	5.39	612
Oct. 28	W. G. Hoyt	80	216	2.27	5.23	490
Dec. 22	F. J. Shuttleworth	65	124	.91	4.60	[d]112

[a] Measurements made under complete ice cover. Gage height to top of ice, 4.34 feet; average thickness of ice, 0.8 foot.

[b] Poor measurements; not enough lead weights for velocities.

[c] Discharge affected by log jam below bridge.

[d] Measurement made under complete ice cover. Gage height top of ice, 4.60 feet; average hickness of ice, 0.8 foot.

Mean Daily Discharge, Second-feet, of Sacandaga River at Wells, N. Y.

DAY.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.					
1	......	26	194	780	390
2	......	26	186	820	360
3	......	44	215	3,320	360
4	......	300	206	2,280	360
5	......	405	455	1,240	348
6	......	270	360	1,860	344
7	......	200	430	4,260	336
8	......	132	332	3,660	328
9	......	122	348	2,470	320
10	......	146	455	1,470	308
11	......	227	405	1,150	1,170
12	......	820	360	1,070	2,420
13	......	410	670	900	1,210
14	......	250	540	705	588
15	......	186	470	635	......
16	......	134	455	570	......
17	......	134	420	540	......
18	......	118	380	480	......
19	......	104	340	455	......
20	......	104	332	430	......
21	......	102	320	405	......
22	......	104	320	540	......
23	......	92	308	475	......
24	......	134	296	470	......
25	26	186	256	470	......
26	26	159	230	470	......
27	26	134	246	470	......
28	24	122	1,820	455	......
29	22	186	2,000	430	......
30	22	178	1,190	430	......
31	22	......	1,520	......	......
Mean	......	185	518	1,120	......

Mean Daily Discharge, Second-feet, of Sacandaga River at Wells, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
1	......	250	470	1,930	5,440	726	88	36	16	50	138	192
2	......	250	420	1,670	7,940	820	81	28	16	74	130	165
3	......	250	420	1,460	4,170	614	74	26	15	79	115	106
4	......	250	450	1,030	4,170	528	70	31	15	79	74	232
5	......	250	450	954	4,600	528	74	35	14	52	79	177
6	......	250	450	1,070	3,740	470	70	54	14	45	70	138
7	......	250	385	1,670	3,150	405	81	58	16	42	61	225
8	......	250	364	2,790	3,240	372	97	52	16	32	56	470
9	480	250	360	4,270	2,900	360	83	38	15	29	54	564
10	480	250	364	3,630	1,720	360	70	46	14	26	54	540
11	480	250	364	4,700	4,170	332	59	41	14	74	81	492
12	480	250	372	3,900	1,920	300	54	31	14	61	160	460
13	470	250	410	3,050	1,510	268	50	30	13	56	142	410
14	430	250	410	3,900	1,090	242	46	36	12	46	118	380
15	380	2,520	1,000	3,250	1,410	225	41	32	12	42	115	364
16	385	5,290	1,130	2,070	1,410	201	35	30	12	36	115	324
17	405	2,760	1,030	1,740	1,070	180	38	31	12	35	90	284
18	430	1,740	909	1,480	1,320	195	145	38	11	31	83	228
19	430	1,580	788	2,720	726	225	171	35	11	28	81	225
20	440	1,260	712	2,520	756	225	110	35	11	26	97	219
21	372	1,030	607	2,220	600	189	84	33	10	25	103	195
22	340	1,030	588	2,140	780	165	92	27	9	24	85	189
23	390	828	576	2,760	684	152	79	32	10	24	87	195
24	380	712	712	5,330	756	152	65	26	10	26	89	195
25	340	656	954	6,010	884	152	58	23	10	26	125	189
26	340	546	909	5,600	492	135	70	21	10	44	201	180
27	260	546	1,540	5,840	570	110	72	20	11	280	405	183
28	242	528	3,080	5,300	528	103	65	18	12	165	292	180
29	260	480	4,950	4,700	552	97	67	17	120	256	165	177
30	260	......	3,220	4,530	540	90	54	17	87	228	155	183
31	246	......	2,520	......	705	......	38	17	......	165	......	189
Mean	379	862	997	3,140	2,050	297	73.6	32.1	18.7	71.2	121	266

Note.— February 1 to 14, inclusive, discharge estimated.

Mean Daily Discharge, Second-feet, of Sacandaga River at Wells, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1......	192	300	1,170	552	2,090	552	120	44	24	42	31	90
2......	189	300	945	656	3,490	528	113	36	24	35	31	85
3......	180	300	804	945	2,130	470	171	36	23	31	31	74
4......	192	300	726	1,040	2,820	470	150	34	23	28	33	74
5......	242	300	705	990	2,130	570	125	33	24	26	35	66
6......	1,050	300	684	1,630	3,490	1,210	113	32	24	25	35	74
7......	700	1,000	588	4,880	5,670	900	101	31	23	24	30	81
8......	500	800	570	5,560	3,630	635	90	30	21	23	25	70
9......	500	700	552	4,650	1,690	510	83	28	20	21	22	92
10......	400	640	516	3,120	3,580	528	79	28	21	21	23	145
11......	440	800	528	1,870	4,940	884	74	26	24	22	30	97
12......	310	700	516	1,690	3,240	600	68	25	23	23	33	88
13......	280	600	475	2,790	2,950	570	59	24	22	23	33	76
14......	300	550	504	8,050	3,010	588	58	24	20	24	33	65
15......	360	650	528	6,690	2,600	492	58	30	20	25	33	65
16......	390	700	540	5,280	2,130	372	52	47	20	25	33	65
17......	340	600	470	4,680	1,560	308	58	128	18	33	41	65
18......	300	600	440	5,160	1,240	372	59	135	18	33	47	65
19......	260	500	492	5,160	1,300	390	62	115	18	33	50	65
20......	230	1,500	455	5,840	1,320	455	58	88	18	33	54	65
21......	200	2,800	405	3,290	1,280	372	58	70	18	31	58	65
22......	175	2,250	405	4,710	1,140	308	62	62	17	54	58	65
23......	175	1,350	405	4,340	850	268	97	58	17	66	92	65
24......	250	1,120	390	4,000	635	232	135	47	24	52	118	65
25......	1,400	2,400	372	2,350	588	207	142	34	26	44	118	65
26......	1,400	1,600	470	2,950	614	189	120	30	26	41	130	65
27......	1,000	1,200	460	3,830	614	180	88	28	28	41	160	65
28......	700	1,200	492	4,000	656	165	70	25	35	35	128	65
29......	600	......	528	4,140	684	142	62	26	44	38	103	65
30......	500	......	460	2,900	614	125	54	24	47	30	97	65
31......	400	......	470	......	576	......	52	24	......	31	.....	65

NOTE.— Daily discharge during the periods of ice conditions based on measurements made under ice cover, climatological reports, and on intercomparison of discharge of Sacandaga river stations. Daily discharge during open period based on fairly well defined rating below 8 feet.

Mean Daily Discharge, Second-feet, of Sacandaga River at Wells, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	51	470	4,070	4,690	990	2,130	152	54	60	540	292	160
2......	51	450	3,750	4,170	945	1,900	155	50	70	440	276	160
3......	54	440	2,940	3,110	1,080	1,680	138	54	104	360	292	50
4......	55	440	2,290	2,780	1,130	1,600	120	280	253	316	390	50
5......	58	450	1,980	2,910	1,080	1,680	113	480	232	268	670	104
6......	64	460	1,810	2,780	1,080	2,030	92	260	260	268	656	200
7......	66	470	1,860	2,630	1,080	2,390	50	152	219	242	635	232
8......	67	480	1,540	2,210	990	1,680	70	120	180	225	588	164
9......	67	490	1,420	1,540	990	1,180	62	106	152	232	528	116
10......	67	490	1,360	935	836	990	50	104	125	219	492	104
11......	66	508	1,260	894	804	1,010	58	390	106	189	450	80
12......	69	470	1,100	850	726	1,280	50	280	92	165	430	104
13......	69	449	1,010	1,140	684	1,160	48	180	94	195	332	86
14......	69	464	900	1,100	684	836	44	135	135	201	292	104
15......	69	444	780	670	684	656	41	120	120	189	284	104
16......	69	454	655	720	756	570	47	348	106	177	268	116
17......	69	433	663	720	684	656	70	308	92	165	268	134
18......	93	441	628	1,620	740	726	68	280	81	152	232	134
19......	322	414	628	2,710	850	614	60	232	83	145	210	134
20......	443	373	614	2,000	820	470	52	180	79	145	219	128
21......	492	391	804	755	1,040	372	47	145	70	145	210	116
22......	2,790	536	1,260	745	900	308	54	135	68	160	201	116
23......	1,920	630	2,410	822	918	292	70	120	62	253	201	116
24......	1,300	677	3,540	298	1,200	256	64	106	58	210	213	164
25......	1,140	650	4,310	545	1,680	225	60	110	140	219	195	220
26......	820	582	4,380	945	2,510	195	62	101	405	268	189	295
27......	570	698	2,870	836	1,680	195	62	92	2,980	316	189	295
28......	475	4,850	2,780	945	1,200	180	70	81	1,700	528	171	305
29......	440	.....	3,990	990	1,100	183	94	74	1,300	492	171	305
30......	420	.....	4,870	990	1,160	160	74	70	1,010	480	165	(305)
31......	470	.....	4,870	......	1,200	......	60	70	......	348	.....	(305)
Mean..	412	646	2,170	1,600	1,040	920	72.8	168	348	266	324	(161)

NOTE.— Daily discharge during the periods of ice conditions based on measurements made under ice cover, climatological reports, and on intercomparison of discharge of Sacandaga stations. Daily discharge during open period based on a fairly well defined rating below 8 feet. Log jam conditions from April 10 to 25; used special rating table.

Monthly Discharge of Sacandaga River at Wells, N. Y.
[Drainage area, 263 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1907.					
August, 25-31	26	24	25	0.095	0.02
September	820	26	185	0.703	0.78
October	2,000	186	518	1.97	2.27
November	4,260	405	1,120	4.26	4.75
December	....	....	(800)	3.04	3.50
1908.					
January	....	242	(450)	1.71	1.97
February	5,290	....	(862)	3.28	3.54
March	4,950	360	997	3.79	4.37
April	6,010	954	3,140	11.90	13.28
May	7,940	492	2,050	7.79	8.98
June	820	90	297	1.13	1.26
July	171	35	73.6	0.280	0.32
August	58	17	32.1	0.122	0.14
September	120	9	18.7	0.071	0.08
October	280	24	71.2	0.271	0.31
November	405	54	121	0.460	0.51
December	564	106	266	1.01	1.16
The year	7,940	9	698	2.65	35.92
1909.					
January	1,400	175	(457)	1.74	2.01
February	2,800	300	(931)	3.54	3.69
March	1,170	372	(550)	2.09	2.41
April	8,050	552	3,590	13.70	15.29
May	5,670	576	2,040	7.76	8.95
June	1,210	125	453	1.72	1.92
July	171	52	86.8	0.330	0.38
August	135	24	45.2	0.172	0.20
September	47	17	23.7	0.090	0.10
October	66	21	32.7	0.124	0.14
November	160	22	58.2	0.221	0.25
December	145	65	(73.6)	0.280	0.32
The year	8,050	17	695	2.65	35.66
1910.					
January	2,790	51	412	1.56	1.80
February	4,850	373	646	2.45	2.55
March	4,870	614	2,170	8.25	9.51
April	4,690	298	1,600	6.08	6.78
May	2,510	684	1,040	3.95	4.55
June	2,390	160	920	3.50	3.90
July	155	41	728	0.277	0.32
August	480	50	168	0.639	0.74
September	2,980	58	348	1.32	1.47
October	540	145	266	1.01	1.16
November	670	165	324	0.23	1.37
December	305	50	161	0.612	0.71
The year	4,870	41	677	2.57	34.86

NOTE.— Discharge December 15, 1907, to February 14, 1908, estimated on basis of general run-off conditions in the upper Hudson drainage basin.
Discharge December 15 to 31, 1907, 939 second-feet.
Discharge February 1 to 14, 1908, 250 second-feet.

SCHROON RIVER.

SCHROON RIVER AT RIVERBANK, N. Y.

This station is located on the steel highway bridge near Riverbank postoffice, between the towns of Warrensburg and Bolton, about 9 miles north of the village of Warrensburg and about 10 miles down-stream from the outlet of Schroon lake. It was established September 23, 1907, by the N. Y. State Water Supply Commission in coöperation with the U. S. Geological Survey, to obtain general statistical data in regard to the flow of Schroon river.

There are several dams at the village of Warrensburg used for power purposes. During September, 1907, a timber crib dam was constructed at Starbuckville, about 6 miles above the gaging station, for storage purposes, this affording a head of some 8 feet and ponding water to Schroon lake. Tumble Head falls begin about 1 mile above the gaging station and extend up-stream for about a mile farther, affording a total fall of some 30 feet.

The datum of the chain gage attached to the bridge has remained the same during the maintenance of the station. During the winter months the discharge is affected by ice conditions. Conditions for obtaining accurate discharge data are good and a very good rating curve has been developed. All measurements are made from the bridge.

Since 1907, the regimen of flow of Schroon river during the low-water season has been considerably affected by the storage held in Schroon lake.

Information in regard to this station is contained in the annual reports of the U. S. Gelogical Survey.

Current-meter Discharge Measurements of Schroon River at Riverbank, N. Y.

DATE.	Hydrographer.	Mean gage reading.	Total area.	Total width.	Corrected discharge.
			Square feet.	*Feet.*	*Second-feet.*
1907.					
Sept. 2	Barrows and Hoyt	1.18	102	42.5	94.8
Sept. 2	Barrows and Hoyt	1.18	100	41.5	91.2
Sept. 23	Hoyt and Pierson	1.90	177	63	321
Oct. 3	Pierson	2.26	190	67	463
Oct. 3	Pierson	2.25	185	67	438
Oct. 23	Pierson	2.32	190	65	492
Nov. 11	Pierson	5.47	419	84	3,360
Nov. 14	Pierson	4.33	298	71	2,000
Nov. 27	Pierson	2.92	214	67	768
Dec. 14	Pierson	3.63	266	74	1,240
Dec. 19 *a*	Pierson	3.48	262	74	1,240
1908.					
Jan. 23	Wood and Pierson	3.02	216	72	766
July 6 *b*	G. M. Brett	2.92	246	74	517
July 6 *b*	G. M. Brett	2.92	247	74	514
July 16	G. M. Brett	1.85	163	67	288
Dec. 31 *c*	C. R. Adams	1.54	136	57.5	183
1909.					
Jan. 21 *d*	C. R. Adams	2.11	150	65	287
June 18	Covert and Cooper	3.28	260	75	1.040
Dec. 11 *e*	Hoyt and James	1.71	193	64	184

a Considerable anchor ice.
b Probable backwater from log jam below.
c River under partial ice cover.
d River under partial ice cover; gage height to top of ice, 2.22 feet; average thickness of ice 0.67
e Ice along the shores affected the measurement.

Current-meter Discharge Measurements of Schroon River at Riverbank, N. Y.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
1910.		*Feet.*	*Square feet.*	*Feet per second.*	*Feet.*	*Second-feet.*
Jan. 20......	W. G. Hoyt..................	62	138	1.01	1.73	*a*139
Feb. 17......	C. C. Covert..................	72	194	1.84	2.63	*b*358
April 1......	W. G. Hoyt..................	85	593	9.90	7.22	5,870
April 2......	W. G. Hoyt..................	85	600	9.58	7.19	5,750
April 4......	W. G. Hoyt..................	85	542	8.94	6.52	4,840
April 5......	W. G. Hoyt..................	85	508	8.64	6.21	4,390
June 16......	Covert and Phelan...........	78	284	4.60	3.54	1,310
Dec. 28......	F. J. Shuttleworth............	62	166	1.12	1.70	*c*186
Dec. 28......	F. J. Shuttleworth............	102	224	1.34	2.00	*d*301

a Complete ice cover. Gage height to top of ice, 1.83 feet; average thickness of ice, 1 foot.

b Complete ice cover. Gage height to top of ice, 2.73 feet; average thickness of ice, 1 foot.

c Complete ice cover. Gage height to top of ice, 1.7 feet; to bottom, 0.7 foot; average thickness ice, 0.88 foot.

d Complete ice cover. Gage height to top of ice, 2 feet; to bottom, 0.9 foot; average thickness ce, 1.30 feet.

Mean Daily Discharge, Second-feet, of Schroon River at Riverbank, N. Y.

DAY.	Sept.	Oct.	Nov.	Dec.
1907.				
1..........	(95)	522	776	806
2..........	95	485	868	776
3..........	125	476	1,080	748
4..........	120	441	868	824
5..........	146	467	1,570	776
6..........	223	432	1,570	776
7..........	239	467	2,050	721
8..........	223	618	3,300	658
9..........	191	643	3,860	694
10..........	207	721	3,700	668
11..........	223	694	3,400	568
12..........	256	668	2,800	788
13..........	273	618	2,270	1,200
14..........	273	608	2,050	1,290
15..........	51	608	1,570	1,310
16..........	48	578	1,570	1,290
17..........	61	593	1,240	1,290
18..........	51	568	1,470	1,240
19..........	51	545	933	1,200
20..........	68	531	1,040	1,040
21..........	51	522	913	1,040
22..........	72	513	933	933
23..........	308	499	849	1,082
24..........	350	485	836	1,290
25..........	312	485	788	1,570
26..........	331	236	668	1,760
27..........	305	432	748	1,740
28..........	210	568	721	1,780
29..........	97	593	748	1,730
30..........	476	608	836	1,670
31..........	......	668	......	1,780
Mean..........	184	545	1,530	1,130

NOTE.—Extreme low water flow corresponds to the 95 second-feet equivalent of 0.18 cubic feet per second per square mile, measured on September 2 (just before drought was broken by rainfall) September 15-22, inclusive, is not natural flow, as water was being held in Schroon Lake by a dam completed at that time.

Mean Daily Discharge, Second-feet, of Schroon River at Riverbank, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
1......	1,780	1,290	836	3,640	4,120	1,240	1,200	85	146	172	57	232
2......	1,670	1,340	900	3,460	4,300	1,290	900	97	120	220	184	216
3......	1,570	1,340	1,120	3,340	4,240	1,160	900	109	120	70	283	200
4......	1,470	1,240	1,040	3,040	4,000	1,080	900	97	133	59	247	216
5......	1,340	1,380	1,000	2,740	3,760	1,470	276	136	146	204	266	200
6......	1,290	1,040	900	2,620	3,460	1,520	748	120	120	188	200	*a*(195)
7......	1,380	1,040	868	2,680	3,280	748	522	95	146	204	57	190
8......	1,080	1,000	836	2,800	3,640	776	499	107	146	188	39	217
9......	1,000	1,000	836	3,460	3,740	1,040	411	83	146	172	232	*a*(237)
10......	966	1,000	966	3,700	3,880	643	390	133	133	144	232	232
11......	1,000	966	1,040	4,120	3,640	522	390	207	120	70	232	212
12......	933	966	966	4,480	3,280	1,290	122	146	133	204	216	218
13......	933	836	966	4,360	3,220	1,080	370	120	107	172	216	208
14......	868	806	1,000	3,940	3,100	411	350	107	146	172	200	233
15......	966	933	1,040	3,760	2,860	499	331	107	256	204	169	202
16......	748	806	1,160	3,460	2,800	545	242	83	273	188	216	218
17......	836	721	1,120	3,160	2,860	522	149	107	256	70	200	233
18......	776	900	1,120	3,040	2,800	476	136	107	172	49	200	202
19......	836	1,000	1,160	2,920	2,560	1,240	109	95	117	172	200	218
20......	868	1,200	1,200	2,560	2,270	1,120	149	120	81	172	184	172
21......	836	1,430	1,160	2,440	2,000	1,240	122	120	220	172	184	202
22......	776	1,380	1,080	2,330	1,840	1,160	122	107	220	158	155	187
23......	836	1,570	1,200	2,100	1,840	1,120	97	83	204	144	200	202
24......	806	1,430	1,290	2,000	1,670	966	122	107	204	144	167	187
25......	966	1,340	1,430	2,220	1,620	1,120	136	120	188	40	200	159
26......	748	1,340	1,470	2,330	1,470	1,080	109	133	59	49	216	172
27......	721	1,240	1,780	2,680	1,840	1,000	136	146	49	220	200	144
28......	748	1,120	1,570	3,400	1,380	276	109	146	172	236	232	159
29......	694	1,000	2,220	4,120	1,380	312	109	133	236	236	216	159
30......	933	......	3,400	4,060	1,890	1,040	136	133	220	232	232	144
31......	900	......	3,640	......	1,470	....	97	146	......	200	......	15
Mean..	1,008	1,126	1,300	3,165	2,790	933	335	117	160	159	195	198

a Gage height affected by anchor ice; discharge interpolated.

NOTE.— During the period, December 6 to 31, inclusive, estimates of discharge are based upon gaging of December 31.

Mean Daily Discharge, Second-feet, of Schroon River at Riverbank, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1......	130	300	1,890	946	2,350	1,030	806	86	86	122	122	294
2......	140	300	1,630	1,060	2,290	920	806	86	74	86	164	276
3......	110	300	1,480	1,140	2,470	920	721	74	97	136	178	276
4......	130	300	1,440	1,140	2,580	855	668	122	74	136	178	259
5......	140	420	1,300	1,490	2,470	1,100	643	122	74	136	164	259
6......	170	550	1,170	1,490	2,350	1,320	618	122	74	136	164	242
7......	200	500	1,130	2,120	2,470	1,760	593	136	86	149	44	242
8......	220	480	1,170	3,720	2,780	1,710	545	86	86	122	194	242
9......	255	500	1,210	4,560	2,840	1,500	522	110	74	122	164	242
10......	255	550	1,390	4,600	2,840	1,500	476	110	74	110	178	242
11......	284	600	973	4,380	3,380	1,460	390	122	86	122	164	242
12......	280	650	1,210	3,960	4,040	1,360	432	97	74	53	149	250
13......	270	700	1,130	3,840	4,040	1,180	432	97	136	178	164	250
14......	280	713	1,050	4,440	3,800	1,320	390	97	122	178	53	242
15......	284	726	1,010	6,540	3,500	1,230	390	86	110	178	149	242
16......	284	769	973	7,200	3,440	1,320	350	122	122	44	178	242
17......	284	812	907	6,930	3,500	855	312	97	122	28	226	242
18......	284	812	842	6,540	3,440	1,060	97	110	136	64	194	226
19......	300	812	812	6,360	3,200	966	136	97	149	35	178	210
20......	330	973	812	6,120	3,140	900	178	97	122	53	178	200
21......	287	1,130	726	5,880	2,960	933	97	86	122	122	178	190
22......	241	1,090	726	5,610	2,780	868	110	74	110	122	178	178
23......	184	1,210	673	5,130	2,600	1,040	122	110	110	122	194	170
24......	331	1,580	673	4,560	2,300	966	122	122	122	122	178	165
25......	315	1,630	726	4,140	2,080	868	97	97	122	110	210	165
26......	284	2,230	849	3,720	2,080	836	97	97	97	110	276	165
27......	290	1,890	818	3,300	1,140	776	110	97	97	122	294	163
28......	300	1,890	849	3,060	1,140	966	86	86	178	122	294	160
29......	350	......	881	2,760	1,230	836	86	86	149	122	331	160
30......	350	......	913	2,470	1,100	836	110	86	149	74	331	160
31......	350	......	913	......	1,100	......	97	97	......	64	......	160

NOTE.— Daily discharge during the period of ice conditions estimated on the basis of two measurements made under ice cover.

Mean Daily Discharge, Second-feet, of Schroon River at Riverbank, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	160	310	579	5,460	1,940	2,470	694	136	331	432	411	294
2......	177	310	720	5,420	1,870	2,270	259	164	350	390	432	312
3......	155	328	858	5,060	1,970	2,000	226	136	390	432	390	331
4......	153	328	912	4,620	1,890	1,840	259	350	350	411	411	259
5......	140	310	938	4,220	1,970	1,730	608	210	350	411	476	276
6......	149	297	1,000	3,880	2,080	1,840	499	178	390	411	454	276
7......	165	310	1,220	3,740	2,160	1,800	499	164	390	390	476	312
8......	168	324	1,400	3,540	2,000	2,050	432	178	411	370	476	294
9......	176	324	1,840	3,340	2,050	2,050	432	178	390	350	476	250
10......	158	324	1,860	3,040	2,000	2,000	350	164	370	370	476	205
11......	160	310	2,020	2,500	1,940	1,840	350	178	331	370	476	190
12......	157	324	2,060	2,000	1,940	1,840	226	164	350	390	454	175
13......	166	351	2,090	2,160	1,890	1,670	242	149	390	370	411	140
14......	152	396	1,910	2,000	1,840	1,400	242	122	194	350	454	150
15......	150	396	1,780	1,890	1,520	1,200	210	164	164	350	411	200
16......	144	352	1,670	1,760	1,520	1,240	226	178	178	294	390	190
17......	145	358	1,570	1,650	1,400	1,200	178	164	350	390	411	180
18......	140	381	1,470	1,400	966	1,120	194	164	331	390	432	140
19......	196	396	1,310	1,550	966	1,080	178	164	331	370	432	190
20......	139	381	1,270	1,910	933	1,000	178	149	312	350	312	190
21......	130	366	1,220	2,380	980	966	164	149	294	312	390	180
22......	165	426	1,220	2,470	836	933	149	164	312	331	390	165
23......	204	411	1,340	2,350	913	868	194	226	294	294	390	165
24......	214	396	1,590	2,220	1,160	836	136	242	294	312	294	220
25......	237	411	2,220	2,190	1,200	776	149	226	370	331	350	190
26......	262	396	2,940	2,100	1,940	694	136	210	370	331	350	220
27......	287	476	3,380	2,190	1,870	806	149	178	411	331	276	220
28......	300	476	3,870	2,130	2,100	806	149	194	522	390	312	190
29......	287	......	3,020	2,100	2,000	836	136	226	499	411	276	200
30......	312	......	4,700	2,050	2,330	748	122	210	432	350	294	220
31......	287	......	5,140	......	2,420	......	97	276	......	411	......	250
Mean...	188	363	1,910	2,780	1,700	1,400	260	186	348	368	399	219

NOTE.— Ice conditions prevailed, January 1 to March 13 and December 8 to 31; flow for this period based on special curve.

Monthly Discharge of Schroon River at Riverbank, N. Y.

[Drainage area, 534 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1907.					
September	476	a48	184	0.345	0.38
October	721	236	545	1.020	1.18
November	3,860	668	1,530	2.870	3.20
December	1,840	568	1,130	2.120	2.44
1908.					
January	1,780	694	(1,010)	1.89	2.18
February	1,570	721	(1,130)	2.12	2.29
March	3,640	836	(1,300)	2.43	2.80
April	4,480	1,990	3,160	5.92	6.60
May	4,300	1,380	2,790	5.22	6.02
June	....	276	700	1.31	1.46
July	1,200	97	335	0.627	0.72
August	207	83	117	0.219	0.25
September	273	49	160	0.300	0.33
October	236	40	159	0.298	0.34
November	283	39	195	0.365	0.41
December	237	144	(198)	0.371	0.43
The year	4,480	39	938	1.76	23.83
1909.					
January	350	110	(255)	0.478	0.55
February	2,230	300	(872)	1.63	1.70
March	1,890	673	(1,040)	1.95	2.25
April	7,200	946	3,970	7.43	8.29
May	4,040	1,100	2,630	4.93	5.68
June	1,760	776	1,110	2.08	2.32
July	806	86	343	0.642	0.74
August	136	74	100	0.187	0.22
September	178	74	108	0.202	0.23
October	178	28	110	0.206	0.24
November	331	44	188	0.352	0.39
December	294	160	(218)	0.408	0.47
The year	7,200	28	912	1.71	23.08
1910.					
January	312	130	188	0.352	0.41
February	476	297	363	0.680	0.70
March	5,140	579	1,910	3.58	4.13
April	5,460	1,400	2,780	5.21	5.81
May	2,420	836	1,700	3.18	3.67
June	2,470	694	1,400	2.62	2.92
July	694	97	260	0.487	0.56
August	350	122	186	0.348	0.40
September	522	164	348	0.652	0.73
October	432	294	368	0.689	0.79
November	476	276	399	0.747	0.83
December	331	140	219	0.410	0.47
The year	5,460	97	843	1.58	21.42

a Not natural flow.

NOTE.— Discharge December 6 to 31, 1908, 196 second-feet, estimated on the basis of a measurement made December 31, under ice conditions.

MISCELLANEOUS DISCHARGE MEASUREMENTS OF STREAMS IN HUDSON RIVER DRAINAGE BASIN

The following miscellaneous discharge measurements were made in Hudson river drainage basin in 1910 by the U. S. Geological survey:

Miscellaneous Discharge Measurements in Hudson River Drainage Basin.

DATE.	Stream.	Tributary to	Locality.	Gage height.	Discharge.
1910.				*Feet.*	*Second-feet.*
Jan. 10.	West branch Sacandaga river	Sacandaga river above Northville	Highway bridge above mouth of Devorse creek, about 2½ miles southwest of Wells	....	a76.9
Aug. 23.	East Stony creek	Sacandaga river near Northville	300 yards above highway bridge on road to Wells	b12.2	16.1
Aug. 23.	West Stony creek	Sacandaga river near Northville	Near highway bridge on road to Benson Center	b15.69	7.4
July 20.	The Branch (Niagara brook)	Schroon river	Farm crossing near White House hotel, 1 mile west of Blue Ridge	c5.62	12.5

a Measurements made under complete ice cover; average thickness of ice, 0.8 foot.
b Reference point on down-stream side of bridge, distance to water surface.
c Distance to water surface from nail in maple tree (10 inches diameter), 150 feet below bridge on right bank.

Current-meter Discharge Measurements of Hudson River at Mechanicville, N. Y.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
1910.		*Feet.*	*Square feet.*	*Feet per second.*	*Feet.*	*Second-feet.*
April 9	C. C. Covert	475	6,550	3.35	4.08	22,000
June 1	W. G. Hoyt	474	5,920	2.92	2.63	17,300
June 14	Covert and Phelan	476	5,610	2.44	2.14	13,700
July 22	J. J. Phelan	443	4,560	.268	.06	1,700
Aug. 13	J. J. Phelan	430	4,930	.59	1.02	2,900
Sept. 27	J. J. Phelan	472	5,010	.42	.68	2,130
Dec. 2	J. J. Phelan	464	4,960	.60	1.00	2,970

NOTE.— Measurements are made from toll bridge below Duncan dam. Construction work in connection with the Barge canal has affected conditions somewhat. Measurements represent flow at the time of making.

CURRENT-METER GAGINGS OF THE CHAMPLAIN CANAL AND GLENS FALLS FEEDER.

The following data have been compiled from the sixth annual report of the N. Y. State Water Supply Commission.

The discharge of Hudson river at both Fort Edward and Mechanicville is diminished somewhat by the water required for operating the Champlian canal. In the northern portion of this canal — from Northumberland to Lake Champlain, at Whitehall — the summit level (between Fort Edward and Fort Ann) is supplied (1) by the Glens Falls feeder, a branch canal, leaving the Hudson about 2 miles above Glens Falls, and (2) by Wood creek.

At Northumberland the canal crosses the Hudson and the southern portion receives its principal water supply here.

The quantity of water diverted from Hudson river for the Champlain canal has been measured occasionally during 1910 at various points and a summary of these measurements follows:

Measurements of Flow in Champlain Canal, Glens Falls Feeder and Spillways.

No.	Date.	LOCALITY.	Mean velocity.	Discharge.	Remarks.
	1910.		*Feet per second.*	*Second-feet.*	
		Below Northumberland.			
1	June 2	Champlain canal at Mechanicville	0.38	91.2	....
2	June 2	Spillway near Mechanicville	......	3	Estimated.
3	June 2	Bridge 34, Stillwater	.60	115	....
4	June 2	Spillway below bridge 34	......	7	Estimated.
5	June 2	Schuyler creek near Stillwater	.33	39	....
6	June 2	Spillway at Bemis	......	5	Estimated.
7	June 2	Bridge 45, below Coveville	.62	170	....
11	June 3	Coveville foot bridge	.48	127	....
9	June 3	Spillway below Coveville	......	5	Estimated.
12	June 3	Champlain canal, Schuylerville	.54	183	....
	June 3	Spillway below Schuylerville	......	5	Estimated.
13	June 3	Lock at head of canal	......	5	Estimated.
1	June 21	Champlain canal at Mechanicville	.30	75.4	....
1	July 21	Champlain canal at Mechanicville	.72	164	....
1	Aug. 13	Champlain canal at Mechanicville	.23	60.5	....
1	Sept. 26	Champlain canal at Mechanicville	.38	88	....
		Above Northumberland.			
14	June 3	Lock at end of canal	......	5	Estimated.
15	June 4	Champlain canal at Fort Edward	.42	110	....
a	June 3	Glens Falls feeder, Hudson Falls	.97	195	....
17	June 4	Spillway above Fort Edward	......	5	Estimated.
18	June 4	Champlain canal above feeder Br. No. 100	.36	135	....
20	June 4	Glens Falls feeder above Glens Falls	.87	216	....
	June 15	Champlain canal, Maple St. Br. above Br. 100	.22	74.5	....
20	June 15	Glens Falls feeder above Glens Falls	.75	177	....
16	Aug. 12	Glens Falls feeder, Hudson Falls	.56	123	....
20	Aug. 12	Glens Falls feeder, Glens Falls	.77	208	....
16	Sept. 26	Glens Falls feeder, Hudson Falls	.79	182	....
20	Sept. 26	Glens Falls feeder, Glens Falls	.71	190	....
16	Oct. 14	Glens Falls feeder, Hudson Falls	.88	188	....
20	Oct. 14	Glens Falls feeder, Glens Falls	.83	210	....

a Brown bridge.

Descriptions of measuring points. Numbers correspond with points at which measurements have been made.

1. Made from Saratoga street bridge.

2. This spillway is about 250 yards above mill of West Virginia Pulp Company at Mechanicville; is 90 feet across; water flowing over about ½ inch in depth.

5. Schuyler creek flows into the canal opposite the Stillwater

spillway; no measurement of this could be made, but estimated flow was 10 or 15 second-feet.

6. Measurement from bridge at Stillwater.

7. Measurement from bridge No. 45, opposite W. F. Curtis's.

8. Spillway between bridges Nos. 46 and 47; not sufficient flow for measurement. Estimated at 5 to 8 second-feet.

9. Spillway just above bridge No. 51; estimated flow at 1 second-foot.

10. Small spillway 75 yards below Coveville; estimated flow, 4 to 5 second-feet.

11. Measurement from footbridge behind Coveville post-office.

12. Measurement from bridge No. 63. There are three spillways just below this bridge.

13. Lock not in use at this time; estimated leakage, 4 to 6 second-feet.

14. Lock at end of canal; estimated leakage, 3 to 5 second-feet.

15. At East street bridge, Fort Edward.

16. From Change bridge west of trolley line at Hudson Falls.

17. From bridge 45 feet north of entrance of Glens Falls feeder; current runs north.

18. There is but one bridge between Fort Edward and Glens Falls feeder, about 150 yards above Fort Edward lock; barely a trace of current here in canal. Estimated flow over lock gates, 10 or 12 second-feet. Between Fort Edward and Glens Falls feeder there is one small waste weir; estimated flow over this, 1 second-foot.

19. At plate-girder highway bridge at Glens Falls.

20. At Change bridge near feeder dam, Glens Falls.

Results of discharge measurements to show diversion from Hudson river for canal purposes above For Edward and Mechanicville gaging stations.

DATE OF MEASUREMENT.	FEEDER AT		CHAMPLAIN CANAL.		
	Glens Falls.	Hudson Falls.	Fort Edward.	Above Feeder.	Saratoga street, Mechanicville.
1910.					
June 2, 3, 4	216	195	88	107	91
June 15–21	177	(160)	(72)	(88)	75
July 21	......	......	......	......	164
August 12–13	208	123	55	68	60.5
September 26	190	178	80	98	88
October 14	210	188	85	103	(90)
Mean of observed quantities	200	170	......	94	96

DELAWARE RIVER DRAINAGE BASIN.

DESCRIPTION OF DELAWARE RIVER.

The head waters of Delaware river rise in Delaware, Greene and Schoharie counties, N. Y., the source of the main stream, which is commonly known as West branch, to distinguish it from the smaller East or Pepacton branch, being a small lake almost on the line of Schoharie and Delaware counties, at an elevation of 1,886 feet above tide. From this lake it flows southwestward across central Delaware county to Deposit, where it receives Oquaga creek, a large tributary draining eastern Broome county, and turns abruptly to the southeast, forming the boundary line between New York and Pennsylvania until Port Jervis is reached. Here it turns again to the southwest and flows for a distance of about 40 miles along the base of the Shawangunk range until it passes through the water gap, from which point it flows irregularly southward to Trenton. Below Trenton the course is in general southwestward to Delaware Bay. South of Port Jervis it forms the dividing line between Pennsylvania and New Jersey, and for a few miles it is the boundary between Delaware and New Jersey.

East branch rises at Grand Gorge in northeastern Delaware county, and flows parallel to West branch across southern Delaware county, uniting with the latter stream at Hancock.

The total length of the river from the mouth to the head of West branch is about 410 miles; its drainage area, measured at Philadelphia and including Schuylkill river, is 10,100 square miles, of which about 2,580 square miles lie in New York, 5,750 in Pennsylvania, and 1,800 in New Jersey. The river is tidal to Trenton, which lies also at the head of navigation.

DELAWARE RIVER AT PORT JERVIS, N. Y.

This station is located at the toll bridge over the Delaware river at Port Jervis. It was established for the United States Weather Bureau by Irving Righter, City Engineer, Port Jervis, N. Y., October 12, 1904.

This station is maintained for the purpose of flood predictions by the Weather Bureau and the records of gage heights are supplied to the Geological Survey for the purpose of determining the regimen of flow of the upper Delaware drainage.

Mongaup river enters the Delaware from the north about 6 miles above the station and Neversink river, also from the north, enters about one mile below the station.

The river section is affected by ice to a greater or less extent each winter.

Considerable difficulty has been experienced in maintaining the datum of the chain gage constant. On September 4, 1908, a careful investigation was made and in order to avoid negative readings a change in the original datum of about 2 feet, as nearly as it could be determined, was made. The new chain length set on this date was 36.47 feet from rivet marker to the end of the weight. The relation between the gage datum and the following bench-marks was determined:

Port Jervis city bench-mark, from which the gage was originally established, is a cross located on the door-sill of the schoolhouse on Thompson street near Water street. Elevation above gage datum, 27.75 feet.

Bench-mark No. 2 is top of down-stream left corner of pier of toll bridge. Elevation above gage datum, 29.92 feet.

Bench-mark No. 3 is top of right abutment of toll bridge at apex of angle caused by junction of down-stream wing-wall. Elevation above gage datum, 29.02 feet. The elevation of the datum of the gage is 414.89 feet above mean sea level.

Conditions of flow at this point are constant and a good rating table has been developed for low and medium stages. Careful comparisons of this station with the Riegelsville and the two Hancock stations indicate that the corrections applied to the gage heights were essentially correct and that the discharge data can be fully relied on.

Mean Daily Gage Height, in Feet, of Delaware River at Port Jervis, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	2.3	3.4	13.0	4.6	5.6	3.6	2.4	1.3	1.0	1.5	1.1	2.2
2......	2.1	3.3	11.2	4.2	4.4	3.4	2.3	1.4	1.2	1.4	1.1	2.1
3......	2.1	3.3	10.4	4.0	4.1	3.3	2.2	1.3	1.2	1.4	1.1	2.1
4......	2.3	3.2	8.7	3.7	4.6	3.2	2.2	1.3	1.3	1.2	1.4	2.0
5......	2.3	3.1	7.9	3.5	4.7	3.1	2.0	1.4	1.7	1.1	2.0	2.0
6......	2.3	2.9	7.5	3.2	4.6	3.1	2.0	1.2	2.2	1.0	2.2	2.0
7......	2.5	2.5	8.1	3.9	4.4	3.8	2.0	1.3	2.2	1.0	2.2	2.4
8......	2.8	2.1	9.0	4.1	4.4	3.7	1.9	1.3	2.1	1.0	2.1	2.3
9......	3.9	2.5	7.7	4.1	3.7	3.5	1.8	1.4	2.1	0.9	2.2	2.0
10......	3.9	2.7	6.6	3.8	3.4	3.3	1.8	1.4	1.8	0.8	2.3	2.0
11......	3.7	3.1	5.8	3.4	4.0	3.4	1.7	2.7	1.7	0.8	2.2	2.8
12......	3.6	3.1	5.5	3.4	3.8	4.0	1.7	2.4	1.6	0.8	2.1	2.8
13......	3.6	3.1	5.3	3.7	3.6	4.2	1.7	1.9	1.5	0.8	3.1	2.7
14......	3.6	3.0	5.3	3.5	3.4	4.0	1.7	1.8	1.4	0.7	2.8	2.6
15......	3.5	3.0	5.1	3.2	3.2	3.6	1.6	1.6	1.4	0.7	2.7	2.5
16......	3.5	2.7	4.8	3.2	3.1	3.5	1.6	1.4	1.4	0.7	2.5	......
17......	5.3	2.7	4.6	3.1	3.0	3.5	1.6	1.3	1.4	0.7	2.5	......
18......	3.3	2.7	4.3	3.4	2.9	3.9	1.5	1.2	1.4	0.7	2.3	......
19......	3.4	2.6	4.0	5.3	2.7	3.9	1.7	1.3	1.3	0.7	2.3	3.1
20......	3.5	2.6	4.0	5.6	2.6	3.8	2.0	1.3	1.2	1.1	2.2	2.9
21......	4.1	3.1	5.6	5.1	2.9	3.6	2.0	1.4	1.2	1.1	2.1	2.8
22......	9.4	3.3	6.0	4.9	2.9	3.3	1.5	1.4	1.2	1.1	2.1	2.6
23......	10.9	5.0	5.7	4.7	2.9	3.1	1.5	1.3	1.1	1.2	2.0	2.6
24......	7.5	4.7	5.5	4.6	2.8	2.8	1.5	1.3	1.1	1.1	2.0	3.0
25......	6.1	4.5	6.3	4.5	3.2	2.6	1.4	1.2	1.0	1.1	2.0	3.2
26......	6.1	4.5	7.0	7.2	4.1	2.4	1.4	1.1	1.2	1.3	2.0	3.2
27......	4.7	4.1	6.5	9.3	5.1	2.4	1.3	1.1	1.2	1.2	2.2	4.4
28......	4.1	4.5	6.3	7.1	4.5	2.5	1.3	1.1	1.6	1.2	2.1	3.9
29......	4.1	......	6.0	6.1	4.3	2.7	1.2	1.0	1.5	1.2	2.1	4.0
30......	3.9	......	5.2	5.8	3.8	2.6	1.4	1.0	1.5	1.1	2.2	9.7
31......	3.4	......	4.8	......	3.6	......	1.3	1.0	......	1.1	......	9.7

NOTE.— Gage heights furnished by U. S. Weather Bureau.

Current-meter Discharge Measurements of Delaware River at Port Jervis, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
1910.		*Feet.*	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
Mar. 1 *a*....	W. G. Hoyt....................	11.8±	646	7,850	7.55	59,300
Mar. 2 *c**....	W. G. Hoyt....................	10.9	641	6,760	7.22	48,800
Mar. 3 *c**....	W. G. Hoyt....................	9.82	464	6,190	6.70	41,400
Mar. 4 *b*....	W. G. Hoyt....................	8.55	646	5,730	5.63	32,200
Mar. 7 *c*....	W. W. Hoyt....................	8.14	628	5,490	5.26	28,900
Mar. 9 *c*....	W. G. Hoyt....................	7.25	627	4,860	4.65	22,600
Mar. 10......	W. G. Hoyt....................	6.38	626	4,360	3.96	17,330
May 10......	C. C. Covert....................	3.91	579	2,880	1.96	5,650
July 30......	Hoyt and Carman....................	1.37	460	891	0.734	654

* Large amount of ice flowing and measurements may be much in error.
a Velocity estimated by timing ice cakes, from a measured line on shore.
b Vertical velocity curves taken every 25 feet and measurement computed, using mean from curves.
c Subsurface measurement.

Mean Daily Discharge, Second-feet, Delaware River at Port Jervis, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	1,820	4,360	67,300	8,250	12,500	4,920	2,000	600	390	765	455	1,650
2......	1,490	4,090	52,500	6,810	7,520	4,360	1,820	680	525	680	455	1,490
3......	1,490	4,090	46,000	6,140	6,470	4,090	1,650	600	525	680	455	1,490
4......	1,820	3,820	32,700	5,210	8,250	3,820	1,650	600	600	525	680	1,340
5......	1,820	3,560	26,800	4,640	8,630	3,560	1,340	680	960	455	1,340	1,340
6......	1,820	3,070	23,900	3,820	8,250	3,560	1,340	525	1,650	390	1,650	1,340
7......	2,190	2,190	28,200	5,820	7,520	5,510	1,340	600	1,650	390	1,650	2,000
8......	2,840	1,490	35,000	6,470	7,520	5,210	1,200	600	1,490	390	1,490	1,820
9......	5,820	2,190	25,300	6,470	5,210	4,640	1,080	680	1,490	330	1,650	1,340
10......	5,820	2,610	18,000	5,510	4,360	4,090	1,080	680	1,080	275	1,820	1,340
11......	5,210	3,560	13,500	4,360	6,140	4,360	960	2,610	960	275	1,650	......
12.....	4,920	3,560	12,100	4,360	5,510	6,140	960	2,000	855	275	1,490	......
13......	3,400	3,560	11,100	5,210	4,920	6,810	960	1,200	765	275	3,560	......
14......	3,400	3,310	11,100	4,640	4,360	6,140	960	1,080	680	225	2,840	......
15......	2,900	3,310	10,200	3,820	3,820	4,920	855	855	680	225	2,610	......
16......	2,600	2,610	9,020	3,820	3,560	4,640	855	680	680	225	2,190	......
17.....	2,600	2,610	8,250	3,560	3,310	4,640	855	600	680	225	2,190	......
18......	2,800	2,610	7,160	4,360	3,070	5,820	765	525	680	225	1,820	......
19......	3,200	2,400	6,140	11,100	2,610	5,820	960	600	600	225	1,820	......
20......	4,640	2,400	6,140	21,500	2,400	5,510	1,340	600	525	455	1,650	......
21......	6,470	3,560	12,500	10,200	3,070	4,920	1,340	680	525	455	1,490	......
22......	38,100	4,090	14,600	9,420	3,070	4,090	765	680	525	455	1,490	......
23......	50,100	9,830	13,000	8,630	3,070	3,560	765	600	455	525	1,340	......
24......	23,900	8,630	12,100	8,250	2,840	2,840	765	600	455	455	1,340	......
25......	15,100	7,880	16,200	7,880	3,820	2,400	680	525	390	455	1,340	......
26......	15,100	7,880	20,500	21,800	6,470	2,000	680	455	525	600	1,340	......
27......	8,630	6,470	17,400	37,300	10,200	2,000	600	455	525	525	1,650	......
28......	6,470	7,880	16,200	21,200	7,880	2,190	600	455	855	525	1,490	......
29......	6,470	......	14,600	15,100	7,160	2,610	525	390	765	525	1,490	......
30......	5,820	......	10,700	13,500	5,510	2,400	680	390	765	455	1,650	......
31......	4,360	......	9,020	......	4,920	.....	600	390	......	455	......	......

Monthly Discharge of Delaware River at Port Jervis, N. Y.

[Drainage area, 3,250 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
January	50,100	1,490	7,840	2.41	2.78
February	9,830	1,490	4,200	1.29	1.34
March	67,300	6,140	19,600	6.03	6.95
April	37,300	3,560	9,000	2.77	3.09
May	12,500	2,400	5,610	1.73	1.99
June	6,810	2,000	4,250	1.31	1.46
July	2,000	525	1,030	0.317	0.37
August	2,610	390	730	0.225	0.26
September	1,650	390	775	0.238	0.27
October	765	225	417	0.128	0.15
November	3,560	455	1,600	0.492	0.55

NOTE.— Estimates of discharge for winter periods are provisional and subject to revision for publication in the Federal report for 1910.

EAST BRANCH, DELAWARE RIVER, AT HANCOCK, N. Y.

This station was established October 14, 1902, by Robert E. Horton, and has since been maintained by the U. S. Geological Survey in coöperation with this Department. It is located at the highway bridge one-half mile southeast of the Erie railroad station at Hancock, N. Y., and one mile above the junction with West branch of the Delaware. The Erie railroad bridge is just below the station.

The channel is straight for 600 feet above and 300 feet below the station. The current is swift. Both banks are of medium height and are not liable to overflow. The bed of the stream is composed of rocks and gravel. There are three channels at low water and five channels at high water. During low water the elevation of the water-surface at the station is lower than the water-surface on West branch of the Delaware, but the gage heights are probably not affected by backwater from West branch, as there is considerable fall between the gaging station and the junction of the branches.

Discharge measurements are made from the down-stream side of the five-span iron highway bridge to which the gage is attached. The bridge has a total span of 425.5 feet between abutments. The initial point for soundings is the face of the right abutment at the top.

A standard chain gage is attached to the lower chord of the second span from the left end of the bridge on the up-stream side. It was installed July 21, 1903, to replace the old wire gage. The gage datum was not changed. The length of the chain from the end of the weight to the marker is 32.43 feet. The gage is read twice each day by D. B. Van Etten. The bench-mark is a circular chisel draft on the top of the left abutment on the down-stream side. It is marked "B. M." Its elevation is assumed to be 100.00. The elevation of the top of the gage pulley is 104.47. The elevation of water-surface, when the gage reads zero, is 72.07.

Mean Daily Gage Height, in Feet, of East Branch, Delaware River, at Hancock, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	3.6	3.9	9.7	5.2	5.0	3.8	3.1	2.6	2.4	2.7	2.5	3.2
2......	3.4	4.0	8.9	4.9	4.7	3.7	3.1	2.6	2.4	2.7	2.5	3.2
3......	3.7	3.8	7.8	4.7	4.7	3.7	3.0	2.6	2.4	2.7	2.5	3.2
4......	3.6	3.7	6.9	4.4	4.8	3.5	3.0	2.6	3.1	2.6	2.6	3.1
5......	3.4	3.8	6.2	4.4	4.5	3.4	2.9	2.8	3.4	2.6	2.7	3.3
6......	3.5	3.6	6.1	4.3	4.4	3.6	2.9	2.7	3.3	2.6	2.9	3.4
7......	4.1	4.5	7.0	4.3	4.2	4.1	2.9	2.7	3.4	2.6	3.1	3.4
8......	5.4	4.6	6.9	4.6	4.1	3.8	2.9	2.6	3.3	2.6	3.1	3.5
9......	5.2	4.7	6.0	4.6	4.1	3.6	2.8	2.6	3.1	2.6	3.0	3.4
10......	5.1	4.9	5.5	4.3	4.0	3.6	2.8	2.6	3.0	2.6	3.0	3.3
11......	5.0	4.6	5.1	4.1	3.8	3.7	2.9	2.8	2.9	2.4	3.3	3.8
12......	4.9	4.7	4.9	4.2	3.7	4.1	2.9	2.9	2.8	2.4	3.8	3.8
13......	4.8	4.6	4.7	4.4	3.7	4.0	2.8	2.8	2.9	2.5	3.6	3.7
14......	4.7	4.7	4.8	4.1	3.6	3.9	2.7	2.7	2.8	2.5	3.5	3.6
15......	4.7	4.8	4.6	4.0	3.5	3.8	2.7	2.6	3.0	2.5	3.5	3.6
16......	4.7	4.7	4.4	4.1	3.5	3.7	2.7	2.5	2.9	2.5	3.4	3.7
17......	4.6	4.7	4.5	3.9	3.4	4.0	2.8	2.5	2.9	2.5	3.3	3.6
18......	4.7	4.8	4.2	3.9	3.4	3.9	2.8	2.5	2.7	2.5	3.3	3.6
19......	5.0	4.9	4.2	5.8	3.5	4.3	2.7	2.6	2.7	2.5	3.3	3.7
20......	5.7	4.9	4.4	5.0	3.4	4.1	2.7	2.8	2.7	2.5	3.2	3.7
21......	5.6	5.0	5.2	4.8	3.3	3.8	2.7	2.7	2.6	2.5	3.2	3.7
22......	12.9	6.7	5.2	4.6	3.5	3.7	2.7	2.6	2.6	2.6	3.1	3.6
23......	8.0	7.0	5.0	4.5	3.4	3.6	2.7	2.6	2.6	2.6	3.1	3.5
24......	6.2	6.0	5.5	4.3	3.3	3.5	2.7	2.6	2.6	2.6	3.1	3.6
25......	5.4	5.9	6.0	4.3	3.8	3.4	2.7	2.5	2.7	2.5	3.2	5.0
26......	4.9	5.6	7.1	6.1	4.8	3.3	2.6	2.5	2.8	2.5	3.3	4.6
27......	4.6	5.6	6.3	7.8	4.4	3.3	2.6	2.5	2.8	2.5	3.2	4.4
28......	4.4	7.8	5.7	6.2	4.3	3.3	2.7	2.5	2.8	2.5	3.2	4.4
29......	4.3	......	5.5	5.6	4.0	3.4	2.7	2.5	2.8	2.5	3.2	4.3
30......	4.0	......	5.6	5.4	3.9	3.3	2.7	2.4	2.8	2.5	3.2	4.4
31......	4.0	......	5.5	......	3.8	......	2.7	2.4	......	2.5	......	4.6

NOTE.— Gage heights furnished by U. S. Weather Bureau.
A correction of + 13 feet has been applied from January 1, to May 9. This correction was pplied by adding 0.10 feet to every day of the period, and an additional 0.10 feet to three days in ach group of ten.

Current-meter Discharge Measurements of East Branch, Delaware River, at Hancock, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1910.						
Mar. 1 *a**...	W. G. Hoyt..................	9.13†	......	22,300	7.40	16,500
Mar. 3 *....	W. G. Hoyt..................	7.73	342	1,890	6.00	11,400
Mar. 5 *....	W. G. Hoyt..................	6.15	318	1,400	4.64	6,500
Mar. 8 *....	W. G. Hoyt..................	6.48	324	1,500	5.15	7,730
May 10......	C. C. Covert..................	3.91	304	738	2.17	1,600
July 28 *b*....	W. G. H. & G. E. C...........	2.70	152	224	1.17	262

* Subsurface measurement.
a Measurement partly estimated, large cakes of ice running.
b Measurement made by wading above bridge.

Rating Table for East Branch, Delaware River, at Hancock, N. Y.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
2.00	......	4.00	1,750	6.00	6,430	8.00	13,000	10.00	20,300
2.10	......	4.10	1,930	6.10	6,730	8.10	13,360	10.10	20,680
2.20	53	4.20	2,110	6.20	7,040	8.20	13,720	10.20	21,060
2.30	80	4.30	2,300	6.30	7,360	8.30	14,080	10.30	21,440
2.40	113	4.40	2,490	6.40	7,680	8.40	14,440	10.40	21,820
2.50	153	4.50	2,690	6.50	8,000	8.50	14,800	10.50	22,200
2.60	198	4.60	2,900	6.60	8,320	8.60	15,160	10.60	22,580
2.70	248	4.70	3,120	6.70	8,640	8.70	15,520	10.70	22,960
2.80	304	4.80	3,340	6.80	8,960	8.80	15,880	10.80	23,340
2.90	367	4.90	3,570	6.90	9,290	8.90	16,240	10.90	23,720
3.00	440	5.00	3,800	7.00	9,620	9.00	16,600	11.00	24,100
3.10	525	5.10	4,040	7.10	9,950	9.10	16,970	11.10	24,490
3.20	620	5.20	4,290	7.20	10,280	9.20	17,340	11.20	24,880
3.30	725	5.30	4,540	7.30	10,620	9.30	17,710	11.30	25,270
3.40	840	5.40	4,790	7.40	10,960	9.40	18,080	11.40	25,660
3.50	965	5.50	5,050	7.50	11,300	9.50	18,450	11.50	26,050
3.60	1,100	5.60	5,310	7.60	11,640	9.60	18,820	11.60	26,440
3.70	1,240	5.70	5,580	7.70	11,980	9.70	19,190	11.70	26,830
3.80	1,400	5.80	5,860	7.80	12,320	9.80	19,560	11.80	27,220
3.90	1,570	5.90	6,140	7.90	12,660	9.90	19,930	11.90	27,610
								12.00	28,000

Mean Daily Discharge, Second-feet, of East Branch, Delaware River, at Hancock, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	......	......	19,200	4,290	3,800	1,400	525	198	113	248	153	620
2	......	......	16,200	3,570	3,120	1,240	525	198	113	248	153	620
3	......	......	12,300	3,120	3,120	1,240	440	198	113	248	153	620
4	......	......	9,290	2,490	3,340	965	440	198	525	198	198	525
5	......	......	7,040	2,490	2,690	840	367	304	840	198	248	725
6	......	......	6,730	2,300	2,490	1,100	367	248	725	198	367	840
7	......	......	9,620	2,300	2,110	1,930	367	248	840	198	525	840
8	......	......	9,290	2,900	1,930	1,400	367	198	725	198	525	965
9	......	......	6,430	2,900	1,930	1,100	304	198	525	198	440	840
10	......	......	5,050	2,300	1,750	1,100	304	198	440	198	440	725
11	......	......	4,040	1,930	1,400	1,240	367	304	367	113	725	.....
12	......	......	3,570	2,110	1,240	1,930	367	367	304	113	1,400	.....
13	......	......	3,120	2,490	1,240	1,750	304	304	367	153	1,100	.....
14	......	......	3,340	1,930	1,100	1,570	248	248	304	153	965	.....
15	......	......	2,900	1,750	965	1,400	248	198	440	153	965	.....
16	......	......	2,490	1,930	965	1,240	248	198	367	153	840	.....
17	......	......	2,690	1,570	840	1,750	304	153	367	153	725	.....
18	......	......	2,110	1,570	840	1,570	304	153	248	153	725	.....
19	......	......	2,110	5,860	965	2,300	248	198	248	153	725	.....
20	......	......	2,490	3,800	840	1,930	248	304	248	153	620	.....
21	5,310	3,800	4,290	3,340	725	1,400	248	248	198	153	620	.....
22	31,600	8,640	4,290	2,900	965	1,240	248	198	198	198	525	.....
23	13,000	9,620	3,800	2,690	840	1,100	248	198	198	198	525	.....
24	7,040	6,430	5,050	2,300	725	965	248	198	198	198	525	.....
25	4,790	6,140	6,430	2,300	1,400	840	248	153	248	153	620	.....
26	3,570	5,310	9,950	6,730	3,340	725	198	153	304	153	725	.....
27	2,900	5,310	7,360	12,300	2,490	725	198	153	304	153	620	.....
28	2,490	12,300	5,580	7,040	2,300	725	248	153	304	153	620	.....
29	2,300	.....	5,050	5,310	1,750	840	248	153	304	153	620	.....
30	1,750	.....	5,310	4,790	1,570	725	248	113	304	153	620	.....
31	1,750	.....	5,050	......	1,400	......	248	113	......	153	......	.....

NOTE.— Jan. 1-20, Feb. 1-20, and Dec. 11-31, ice obstruction; record not available. Stream frozen over Jan. to March; record approximate.

Monthly Discharge of East Branch, Delaware River, at Hancock, N. Y.
[Drainage area, 920 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
January	31,600	....	2,560	2.78	3.20
February	12,300	....	2,240	1.44	1.50
March	19,200	2,110	6,200	6.74	7.77
April	12,300	1,570	3,440	3.74	4.17
May	3,800	725	1,750	1.91	2.20
June	2,300	725	1,280	1.39	0.16
July	525	198	307	0.334	0.39
August	367	113	208	0.226	0.26
September	840	113	359	0.390	0.44
October	248	113	174	0.189	0.22
November	1,400	153	600	0.652	0.73
December	....	....	....	....	....

NOTE.— Estimates for frozen period provisional and subject to revision for publication in the Federal report for 1910.

WEST BRANCH, DELAWARE RIVER, AT HANCOCK, N. Y.

This station was established October 15, 1902, by Robert E. Horton, and has since been maintained by the U. S. Geological Survey in coöperation with this Department. It is located one-half mile west of the Erie railroad station at Hancock, N. Y., and about one mile above the mouth of East branch.

The channel is straight for 400 feet above and 800 feet below the bridge. The current is swift. Both banks are high and rocky and are not subject to overflow. The bed of the stream is composed of earth and cobblestones.

Discharge measurements are made from the down-stream side of the bridge, at which the gage is located. The bridge has a single span of 235 feet. The initial point for soundings is the top of the face of the left abutment on the down-stream side. The bridge floor is marked at intervals of five feet with black paint.

The original wire gage was attached to the up-stream side of the bridge. It was replaced July 20, 1903, by a standard chain gage. The location and the gage datum were not changed. The length of the chain from the end of the weight to the marker is 30.44 feet. The gage is read twice each day by David Pulver, the collector of tolls at the bridge. The bench-mark is a circular chisel draft on the up-stream corner of the left abutment. Its elevation is assumed at 100.00. The elevation of the top of the pulley is 106.29. The elevation of water-surface, when the gage reads zero, is 75.75.

Mean Daily Gage Height, in Feet, of West Branch, Delaware River, at Hancock, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1......	3.0	3.9	10.6	4.5	4.9	4.8	3.3	2.5	2.4	2.6	2.3	3.1
2......	3.2	3.9	9.3	4.2	4.6	4.4	3.1	2.6	2.4	2.6	2.4	3.0
3......	3.0	3.8	7.8	4.1	4.7	4.2	3.3	2.6	2.4	2.3	2.3	3.1
4......	3.3	3.7	7.0	4.0	4.6	4.0	3.1	2.5	2.8	2.5	2.3	3.1
5......	2.9	5.2	6.5	3.9	4.5	3.8	3.1	2.5	3.1	2.5	2.6	3.0
6......	3.1	5.0	6.3	3.9	4.2	4.4	2.9	2.5	3.0	2.4	2.9	3.0
7......	4.5	5.1	7.8	3.8	4.1	4.5	2.7	2.4	3.2	2.4	3.1	3.2
8......	5.1	4.9	6.9	4.1	4.2	4.4	2.9	2.5	2.9	2.4	3.0	3.0
9......	4.7	5.0	6.1	3.9	4.1	4.2	2.8	2.6	2.8	2.4	2.8	3.2
10......	4.5	5.4	5.6	3.8	4.5	4.1	2.9	2.5	2.7	2.4	2.8	3.4
11......	4.1	4.8	5.0	3.8	4.2	4.1	2.7	2.7	2.7	2.4	3.9	3.5
12......	4.2	4.7	4.9	3.7	4.2	4.5	2.8	2.6	2.5	2.4	4.0	4.0
13......	4.1	4.6	4.8	4.1	4.0	4.5	2.7	2.6	2.5	2.3	3.5	4.0
14......	4.1	4.5	4.8	3.9	3.9	4.2	2.6	2.6	2.6	2.4	3.5	4.0
15......	4.2	4.6	4.6	3.7	3.8	4.1	2.6	2.5	2.6	2.5	3.4	3.8
16......	4.0	4.5	4.3	3.8	3.8	4.0	2.5	2.5	2.5	2.4	3.3	3.9
17......	3.9	4.8	4.4	3.6	3.7	4.1	2.7	2.5	2.8	2.3	3.2	4.0
18......	4.1	4.9	4.0	3.7	3.6	4.0	2.7	2.4	2.5	2.4	3.1	3.9
19......	4.5	4.7	4.1	4.2	3.6	4.8	2.6	2.5	2.4	2.3	3.1	3.8
20......	5.4	4.6	4.4	4.3	3.6	4.1	2.5	2.4	2.4	2.4	3.5	3.6
21......	5.5	4.7	5.0	4.2	3.5	3.9	2.5	2.4	2.5	2.4	2.8	3.5
22......	11.0	7.1	5.2	4.1	3.4	3.7	2.7	2.6	2.5	2.3	3.1	3.5
23......	7.7	7.1	5.0	4.1	3.4	3.6	2.7	2.4	2.4	2.4	3.0	3.3
24......	6.1	6.1	5.2	4.0	3.3	3.5	2.7	2.4	2.4	2.4	3.0	3.5
25......	5.2	5.7	5.6	4.2	4.2	3.3	2.6	2.5	2.5	2.4	3.1	3.7
26......	5.8	5.4	5.8	4.8	6.1	3.2	2.7	2.5	2.6	.4	3.2	4.7
27......	4.6	5.5	5.6	6.0	5.4	3.2	2.6	2.4	2.5	2.4	3.2	4.6
28......	4.5	11.1	5.1	5.6	5.4	3.2	2.7	2.4	2.7	2.4	3.1	4.5
29......	4.2	......	4.8	5.1	4.7	3.3	2.6	2.4	2.6	2.5	3.1	4.5
30......	3.5	......	4.8	5.1	4.4	3.2	2.7	2.4	2.7	2.3	3.1	5.4
31......	4.0	......	4.5	......	4.5	......	2.6	2.4	......	2.3	......	5.2

NOTE.— Gage heights furnished by U. S. Weather Bureau. A correction of +0.06 ft. has been applied from Jan. 1 to May 10. This correction was applied by adding 0.1 ft. to the gage height of six days in each group of ten.

Current-meter Discharge Measurements of West Branch, Delaware River, at Hancock, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1910.						
March 2 *a*....	W. G. Hoyt....................	9.91	400	2,180	7.66	16,700
March 3 *b*....	W. G. Hoyt....................	7.81	280	1,480	6.14	9,080
March 4 *b*....	W. G. Hoyt....................	6.36	242	1,060	4.52	4,790
March 9 *b*....	W. G. Hoyt....................	6.06	230	992	4.22	4,190
May 10....	C. C. Covert....................	4.6	222	683	2.46	1,680
July 27....	Hoyt and Carman.............	2.63	152	862	1.36	117

a Floating ice.
b Subsurface measurement.

Rating Table for West Branch, Delaware River, at Hancock, N. Y.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
2.00	......	4.00	1,000	6.00	4,100	8.00	9,700	10.00	17,100
2.10	......	4.10	1,110	6.10	4,310	8.10	10,050	10.10	17,490
2.20	25	4.20	1,220	6.20	4,530	8.20	10,400	10.20	17,880
2.30	41	4.30	1,330	6.30	4,760	8.30	10,760	10.30	18,280
2.40	60	4.40	1,440	6.40	5,000	8.40	11,120	10.40	18,680
2.50	83	4.50	1,560	6.50	5,250	8.50	11,480	10.50	19,080
2.60	110	4.60	1,690	6.60	5,510	8.60	11,840	10.60	19,480
2.70	140	4.70	1,830	6.70	5,770	8.70	12,200	10.70	19,880
2.80	175	4.80	1,970	6.80	6,040	8.80	12,560	10.80	20,280
2.90	210	4.90	2,120	6.90	6,320	8.90	12,930	10.90	20,690
3.00	250	5.00	2,280	7.00	6,600	9.00	13,300	11.00	21,110
3.10	295	5.10	2,440	7.10	6,890	9.10	13, 0	11.10	21,530
3.20	345	5.20	2,610	7.20	7, 90	9.20	14,040	11.20	21,950
3.30	405	5.30	2,780	7.30	7,490	9.30	14,420	11.30	22,370
3.40	470	5.40	2,950	7.40	7,790	9.40	14,800	11.40	22,790
3.50	540	5.50	3,130	7.50	8,100	9.50	15,180	11.50	23,210
3.60	615	5.60	3,320	7.60	8,410	9.60	15,560	11.60	23,630
3.70	700	5.70	3,510	7.70	8,730	9.70	15,940	11.70	24,050
3.80	790	5.80	3,700	7.80	9,050	9.80	16,320	11.80	24,479
3.90	890	5.90	3,900	7.90	9,370	9.90	16,710	11.90	24,800

Mean Daily Discharge, Second-feet, of West Branch, Delaware River, at Hancock, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec
1910.												
1	....	......	19,500	1,560	2,120	1,970	405	83	60	110	41	295
2	......	......	14,400	1,220	1,690	1,440	295	110	60	110	60	250
3	....	......	9,050	1,110	1,830	1,220	405	110	60	41	41	295
4	......	......	6,600	1,000	1,690	1,000	295	83	175	83	41	295
5	......	......	5,250	890	1,560	790	295	83	295	83	110	250
6	......	......	4,760	890	1,220	1,440	210	83	250	60	210	250
7	......	......	9,050	790	1,110	1,560	140	60	345	60	295	345
8	......	......	6,320	1,110	1,220	1,440	210	83	210	60	250	250
9	......	......	4,310	890	1,110	1,220	175	110	175	60	175	345
10	......	......	3,320	790	1,560	1,110	210	83	140	60	175	470
11	......	......	2,280	790	1,220	1,110	140	140	140	60	890	......
12	......	......	2,120	700	1,220	1,560	175	110	83	60	1,000	......
13	......	......	1,970	1,110	1,000	1,560	140	110	83	41	540	......
14	......	......	1,970	890	890	1,220	110	110	110	60	540	......
15	......	......	1,690	700	790	1,110	110	83	110	83	470	......
16	......	......	1,330	790	790	1,000	83	83	83	60	405	......
17	......	......	1,440	615	700	1,110	140	83	175	41	345	......
18	......	......	1,000	700	615	1,000	140	60	83	60	295	......
19	......	......	1,110	1,220	615	1,970	110	83	60	41	295	......
20	......	......	1,440	1,330	615	1,110	83	60	60	60	940	......
21	3,130	1,830	2,280	1,220	540	890	83	60	83	60	175	......
22	21,100	6,890	2,610	1,110	470	700	140	110	83	41	295	......
23	8,730	6,890	2,280	1,110	470	615	140	60	60	60	250	......
24	4,310	4,310	2,610	1,000	405	540	140	60	60	60	250	......
25	2,610	3,510	3,320	1,220	1,220	405	110	83	83	60	295	......
26	3,700	2,950	3,700	1,970	4,310	345	140	83	110	60	345	......
27	1,690	3,130	3,320	4,100	2,950	345	110	60	83	60	345	......
28	1,560	21,500	2,440	3,320	2,950	345	140	60	140	60	295	......
29	1,220	......	1,970	2,440	1,830	405	110	60	110	83	295	......
30	540	......	1,970	2,440	1,440	405	140	60	140	41	295	......
31	1,000	......	1,560	......	1,560	......	110	60	......	41	......	......

NOTE.— Jan. 1-20, Feb. 1-20 and Dec. 11-31, ice obstruction; record not available. Stream frozen over, Jan.-March; record approximate.

Monthly Discharge of West Branch, Delaware River, at Hancock, N. Y.
[Drainage area, 680 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
January	21,100	....	1,660	2.44	2.81
February	21,500	....	1,900	2.79	2.90
March	19,500*a*	1,000	4,100	6.03	6.95
April	4,100	615	1,300	1.91	2.13
May	2,120	405	1,350	1.99	2.29
June	1,970	345	1,030	1.51	1.68
July	405	83	169	0.249	0.29
August	140	60	82.8	0.122	0.14
September	345	60	124	0.182	0.20
October	110	41	61.9	0.091	0.10
November	1,000	41	319	0.469	0.52

a Highest stage of flood.
NOTE.— Estimates for winter period provisional and subject to revision for purpose of publication n the Federal 1910 report.

NEVERSINK RIVER DRAINAGE BASIN.

DESCRIPTION.

The Neversink river is formed by the confluence of the east and west branches of Neversink creek, in the western part of Ulster county. It flows in a southerly direction across the counties of Sullivan and Orange into Delaware river at Port Jervis.

Its principal tributaries are Sheldrake creek, coming in from the west through a chain of lakes and joining the river at Thompsonville, about 25 miles from the mouth, and Bush kill, a small tributary from the same side, joining at Oakland valley, some 12 miles further down-stream. From the east the Basher kill, a tributary of considerable importance, formed by the Pine kill and Garmaeu, flows into the Neversink near Godeffroy, about 9 miles from Port Jervis and just above the gaging station, which is located at the suspension highway bridge at this point.

The river drains a narrow valley along the southern slope of the Catskill mountains. There are several reservoirs in the upper watershed, two of which are now in use. The principal power is located at Rose's Point, near Cuddybackville, in the vicinity of the old Delaware and Hudson canal. About one-half mile above this point is a low concrete dam, which diverts water through the old feeder ditch to the plant. This plant supplies Port Jervis, Middletown and other small places in the vicinity with electric light and power.

NEVERSINK RIVER AT GODEFFROY, N. Y.

This station is located at the suspension highway bridge about one-half mile east of the town of Godeffroy and eight miles above the mouth of the river. A staff gage was established at this point, August 4, 1903, and was washed out October 9, in the same year. A new gage was established August 22, 1909, to obtain general statistical and comparative data regarding the flow of the Neversink, and this is maintained by U. S. Geological Survey in co-operation with the State Engineer's Department. This is an enameled iron staff gage bolted to the river face, down-stream side of the left-hand abutment.

Bench-mark No. 1 is on the outer corner base stone, right-hand down-stream tower, marked with crow's-foot and circle; elevation, 15.996. Bench-mark No. 2 is a spike in a birch tree 14 inches in diameter, blazed 3 feet above the ground, on left-hand side of west approach to bridge, 10 feet from up-stream tower; elevation, 16.140. Both points are referred to zero of the gage. The datum of the new gage is 0.98 foot lower than the gage of 1903. Therefore all previously published gage heights for this station should have 0.98 feet added, in order to apply to the present datum. The new gage datum has remained the same during the maintenance of the station. Conditions are good for accurate discharge measurements during the open-water period, except for extreme lower water, when wading measurements have to be resorted to, or a bridge about one mile farther down-stream used. Area of drainage basin above station is 314.4* square miles; area above mouth, 346* square miles.

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* From Bien's Atlas of New York State.

Mean Daily Gage Height, in Feet, of Neversink River at Godeffroy, N. Y.

DAY.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.					
1	2.85	2.74	2.94	3.02	3.36
2	3.02	2.72	3.06	2.67	3.19
3	3.02	3.12	2.92	3.35	3.05
4	3.08	3.32	2.89	3.45	3.00
5	3.08	3.39	3.08	4.26	3.35
6	3.05	3.29	3.04	3.95	3.10
7	3.11	3.29	2.90	3.74	2.73
8	3.05	3.10	3.01	3.66	2.80
9	3.05	3.10	2.98	3.45	2.70
10	3.08	3.10	3.01	3.43	2.84
11	3.94	3.10	3.04	3.48	2.92
12	3.72	3.02	3.01	3.56	3.06
13	3.36	3.08	2.94	3.54	3.10
14	3.08	3.14	2.94	3.52	3.10
15	3.00	3.14	2.96	3.38	2.98
16	3.02	3.10	3.14	3.33	3.09
17	3.10	3.12	2.86	3.30	3.03
18	3.12	3.13	2.82	3.30	3.07
19	3.15	2.90	2.87	3.29	3.10
20	3.15	2.84	2.93	3.22	3.00
21	3.32	2.86	2.88	3.02	.....
22	3.12	2.86	2.91	3.10	.....
23	3.12	2.89	2.92	2.99	.....
24	2.92	2.90	2.88	2.70	.....
25	3.00	3.00	2.92	2.70	.....
26	3.10	2.99	2.86	2.72	.....
27	3.10	3.12	2.97	2.66	.....
28	2.93	3.14	2.98	3.20	.....
29	3.08	3.11	2.90	3.37	.....
30	3.08	3.16	2.61	3.3[illegible]	.....
31	3.08	.....	2.8[illegible]	.....	.....

Note.— Observer' Percy Howe.

Current-meter Discharge Measurements of Neversink River at Godeffroy, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
1910.		*Feet.*	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
March 6	W. G. Hoyt	5.15	160	817	3.10	2,530
March 10	W. G. Hoyt	4.85	157	674	2.49	1,680
July 29*	W. G. Hoyt	2.85	117	109	0.75	81.8
Aug. 1	W. G. Hoyt	3.25	145	183	1.15	211

* Wading below bridge.

Rating Table for Neversink River at Godeffroy, N. Y.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
2.60	40	3.20	190	3.80	560
2.70	55	3.30	240	3.90	650
2.80	75	3.40	290	4.00	740
2.90	95	3.50	350	4.10	840
3.00	120	3.60	410	4.20	940
3.10	150	3.70	480	4.30	1,050

NOTE.— The above table is not applicable to ice conditions. It is based on four discharge measurements made during 1910.

Mean Daily Discharge, Second-feet, of Neversink River at Godeffroy, N. Y.

DAY.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.					
1	85	63	105	126	270
2	126	59	138	50	186
3	126	158	100	265	135
4	144	250	93	320	120
5	144	285	144	1,010	265
6	135	235	132	695	150
7	154	235	95	512	55
8	135	150	123	452	81
9	135	150	115	320	55
10	144	150	123	308	83
11	686	150	132	338	100
12	496	126	123	386	138
13	270	144	105	374	150
14	144	166	105	362	150
15	120	166	110	280	115
16	126	150	166	255	147
17	150	158	87	240	129
18	158	162	79	240	141
19	170	95	89	235	150
20	170	83	102	200	120
21	250	87	91	126	....
22	158	87	97	150	....
23	158	93	100	118	....
24	100	95	91	55	....
25	120	120	100	55	....
26	150	118	87	59	....
27	150	158	112	49	....
28	102	166	115	190	....
29	144	154	95	275	....
30	144	174	42	270	....
31	144	......	79	......	....
Mean	175	146	106	277	....

Monthly Discharge of Neversink River at Godeffroy, N. Y.
[Drainage area, 314 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
August	686	85	175	0.557	0.64
September	285	59	146	0.465	0.52
October	166	42	106	0.338	0.39
November	1,010	50	277	0.882	0.98
December	....	....	....	....	....

MONGAUP RIVER DRAINAGE BASIN.

DESCRIPTION.

The Mongaup river rises near the village of Bradley in Liberty township, Sullivan county. It flows in a southerly direction through Sullivan county to the Delaware river, into which it empties near the village of Mongaup, about 6 miles northwest of Port Jervis.

The stream has a rather narrow, precipitious, well-timbered drainage basin, which is cut up by numerous small tributaries that form outlets to the various small lakes which characterize this drainage. Among the more important of these tributaries are Middle Mongaup, which joins near Bushville, West Mongaup, which joins near Mongaup valley, and Black Lake creek, about 6 miles farther down-stream. These tributaries are all from the right, while from the left enters Kinne brook, about 3 miles below Mongaup valley, and Black brook, some 8 or 10 miles farther down-stream. The last six or seven miles of the stream's course is along the boundary line between Orange and Sullivan counties.

Throughout its course the stream is very precipitious and it offers several opportunities for power development, the most important of which is Mongaup falls, some 8 or 10 miles above the mouth.

MONGAUP RIVER NEAR RIO, N. Y.

This station is located at the steel highway bridge near Partridge Ranch, about six miles above Mongaup village and about fourteen miles from Port Jervis, N. Y. A standard chain gage was established at this point, December 8, 1906, to obtain general statistical and comparative data regarding the flow of the Mongaup. This station is maintained by Charles H. Cooke, C. E., of New York city, in coöperation with the U. S. Geological Survey and the State Engineer's Department of New York. On account of inability to obtain reliable gage readings, earlier observations at this station have not been published.

The chain has a length of 15.14 feet and is referred to the following bench-marks: No. 1, highest point on a large boulder about fifty feet south of the down-stream side of the right abutment, marked with the letters "B. M."; elevation 6.118. No. 2, a point on the bridge seat on the down-stream, right abutment; elevation 12.07.

The bridge has a span of 140 feet. There is one channel at all stages and measurements are made from the down-stream side of the bridge. The channel above the station is straight for about 500 feet and during low and medium stages is divided into two parts by a small island just above the bridge. The channel below the bridge is straight for about 200 feet, when it makes an abrupt turn to the right. The banks on either side are of medium height and rarely overflow, except during extreme high stages. Conditions for measuring at this point are fairly good, except in low stages, when the current becomes rather sluggish. Low-water measurements are usually made by wading at the ripples below the bridge.

Mean Daily Gage Height, in Feet, of Mongaup River at Partridge Ranch, near Rio, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	......	1.48	4.70	1.98	2.25	1.26	.95	.68	.76	.61	.62	.98
2	......	1.46	4.95	1.85	2.05	1.25	.94	.70	.80	.59	.60	.92
3	......	1.48	4.70	1.49	2.10	1.22	.88	.70	.86	.58	.72	.92
4	......	1.38	4.40	1.60	2.20	1.16	.86	.72	1.10	.60	1.15	.98
5	......	1.35	3.90	1.55	2.05	1.18	89	.82	.99	.56	1.62	1.06
6	......	1.32	3.55	1.56	2.02	1.75	.86	.75	.90	.61	1.55	1.12
7	......	1.30	3.95	2.05	1.90	1.62	.82	.72	.86	.62	1.35	1.10
8	......	1.52	3.80	1.98	1.78	1.30	.85	.72	.81	.72	1.15	1.22
9	......	1.58	2.50	1.78	1.71	1.25	.82	.70	.74	.58	1.02	1.12
10	......	1.58	2.25	1.80	1.75	1.40	.76	.66	.75	.59	1.00	1.09
11	......	1.44	2.25	1.62	1.68	1.65	.80	1.25	.74	.64	1.04	......
12	......	1.48	2.21	1.55	1.62	1.70	.78	1.02	.72	.60	1 00	......
13	......	1.52	2.22	1.46	1.59	1.78	.75	.92	.72	.62	1.00	......
14	......	1.60	2.50	1.35	1.50	1.48	.74	.76	.72	.60	.98	......
15	......	1.58	2.28	1.45	1.45	1.42	.75	.75	.76	.62	.95	......
16	......	1.52	2.20	1.45	1.41	1.40	.76	.78	.71	.61	.89	......
17	......	1.55	2.08	1.50	1.40	1.45	.82	.78	.66	.60	.95	......
18	......	1.58	2.05	1.58	1.45	1.38	.91	.94	.70	.60	91	......
19	......	1.56	2.00	2.82	1.50	1.32	.81	.90	.66	.55	.86	......
20	......	1.55	2.18	2.35	1.49	1.21	.75	.86	.69	.56	.86	......
21	......	1.58	2.68	2 00	1.48	1.12	.79	.80	.69	.59	.88	......
22	[a]6.30	2.42	2.58	1.80	1.50	1.08	.80	.72	.68	.71	.89	......
23	3.35	2.39	2.45	1.68	1.44	1.02	.80	.75	.62	.66	.81	......
24	2.55	2.38	2.55	1.65	1.59	1.00	.78	.75	.62	.64	.84	......
25	2.16	2.22	2.52	2.15	1.60	.98	.70	.76	.61	.61	.90	......
26	1.95	2.21	2.46	4.60	1.60	1.04	.68	.68	.62	.64	1.01	......
27	1.95	2.05	2.18	3.45	1.48	.95	.68	.66	.70	.62	.99	......
28	1.80	2.68	2.22	2.66	1.42	.98	.72	.64	.70	.60	.88	......
29	1.68	......	2.11	2.45	1.38	.98	.68	.65	.68	.61	1.02	......
30	1.60	......	2.00	2.50	1.29	.90	.70	.70	.61	.68	1.00	......
31	1.62	......	2.02	......	1.22	......	.70	.68	......	.61	......	......

[a] Ice jam.

Current-meter Discharge Measurement of Mongaup River at Partridge Ranch, near Rio, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1910.						
May 12	C. C. Covert	1.63	138.5	226	1.61	364

Rating Table for Mongaup River at Partridge Ranch, near Rio, N. Y.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*	*Feet.*	*Second-feet.*
0.50	20	2.10	620	3.60	1,810
0.60	30	2.20	680	3.70	1,910
0.70	45	2.30	740	3.80	2,010
0.80	63	2.40	810	3.90	2,110
0.90	86	2.50	880	4.00	2,220
1.00	115	2.60	950	4.10	2,330
1.10	150	2.70	1,020	4.20	2,440
1.20	185	2.80	1,100	4 30	2,550
1.30	220	2.90	1,180	4.40	2,670
1.40	260	3.00	1,260	4.50	2,790
1.50	300	3.10	1,350	4.60	2,910
1.60	345	3.20	1,440	4.70	3,040
1.70	395	3.30	1,530	4.80	3,170
1.80	445	3.40	1,620	4.90	3,300
1.90	500	3.50	1,710	5.00	3,440
2.00	560				

NOTE.— The above table is not applicable to ice conditions. It is based on 5 discharge measurements made during 1908, 1909 and 1910, and is well defined between gage heights 0.7 foot and 2.5 feet.

Daily Discharge, Second-feet, of Mongaup River at Partridge Ranch, near Rio, N. Y.

DAY.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.					
1	......	49	52	42	63
2	......	52	42	44	56
3	......	49	44	36	74
4	......	44	36	44	59
5	......	49	42	49	59
6	......	44	38	52	49
7	......	39	33	45	33
8	39	39	29	42	52
9	44	39	33	42	38
10	45	59	45	44	59
11	52	77	52	45	54
12	39	68	61	45	81
13	44	59	68	44	86
14	44	49	63	42	445
15	63	49	44	45	345
16	92	44	39	45	220
17	146	56	54	38	168
18	327	54	44	38	150
19	164	39	42	36	150
20	122	44	42	39	140
21	100	44	42	36	130
22	84	44	44	36	120
23	72	33	49	39	.....
24	56	49	59	42	.....
25	61	63	59	45	.....
26	54	42	63	59	.....
27	52	39	63	81	.....
28	52	49	61	89	.....
29	52	54	59	59	.....
30	54	56	56	59	.....
31	52	......	52	......	.....
Mean	79.7	49.2	48.7	46.7	119

NOTE.— The above daily discharges are based on a well defined rating. Discharges for December 18 to 22 are estimated, because of ice conditions.

Daily Discharge, Second-feet, of Mongaup River at Partridge Ranch, near Rio, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	......	292	3,040	548	710	206	100	42	56	32	33	109
2	......	284	3,370	472	590	202	98	45	63	29	30	92
3	......	292	3,040	296	620	192	81	45	77	28	49	92
4	......	252	2,670	345	680	171	77	49	150	30	168	109
5	......	240	2,110	322	590	178	84	68	112	26	355	136
6	......	228	1,760	327	572	420	77	54	86	32	322	157
7	......	220	2,160	590	500	355	68	49	77	33	240	150
8	......	309	2,010	548	435	220	74	49	65	49	168	192
9	......	336	880	435	400	202	68	45	52	28	122	157
10	......	336	710	445	420	260	56	39	54	29	115	146
11	......	276	710	355	385	370	63	202	52	36	129	......
12	......	292	686	322	355	395	59	122	49	30	115	......
13	......	309	692	284	340	435	54	92	49	33	115	......
14	......	345	880	240	300	292	52	56	49	30	109	......
15	......	336	728	280	280	268	54	54	56	33	100	......
16	......	309	680	280	264	260	56	59	47	32	84	......
17	......	322	608	300	260	280	68	59	39	30	100	......
18	......	336	590	336	280	252	89	98	45	30	89	......
19	......	327	560	1,120	300	228	65	86	39	25	77	......
20	......	322	668	775	296	188	54	77	44	26	77	......
21	......	336	1,010	560	292	157	61	63	44	29	81	......
22	2,500	824	936	445	300	143	63	49	42	47	84	......
23	1,580	803	845	385	276	122	63	54	33	39	65	......
24	915	796	915	370	340	115	59	54	33	36	72	......
25	656	692	894	650	345	109	45	56	32	32	86	......
26	530	686	852	2,910	345	129	42	42	33	36	118	......
27	530	590	668	1,660	292	100	42	39	45	33	112	......
28	445	1,010	692	992	268	109	49	36	45	30	81	......
29	385	......	626	845	252	109	42	38	42	32	122	......
30	345	......	560	880	216	86	45	45	32	42	115	......
31	355	......	572	......	192	......	45	42	......	32	......	......
Mean...	824	418	1,200	611	377	218	63.0	61.5	54.7	32.5	118	134

NOTE.— Discharge estimated for January 22 because of an ice jam. Other daily discharges are based on a rating curve well defined below 1,000 second-feet. Discharges for March 1 to 9 may be largely in error.

Monthly Discharge of Mongaup River at Partridge Ranch, near Rio, N. Y.
[Drainage area, 189 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1909.					
August, 8-31	327	39	79.7	0.422	0.38
September	77	33	49.2	0.260	0.29
October	68	29	48.7	0.258	0.30
November	89	36	46.7	0.247	0.28
December, 1-22	445	33	119	0.630	0.52
1910.					
January, 22-31	2,500	345	824	4.36	1.62
February	1,010	220	418	2.21	2.30
March	3,370	560	1,200	6.35	7.32
April	2,910	240	611	3.23	3.60
May	710	192	377	1.99	2.29
June	435	86	218	1.15	1.28
July	100	42	63	0.333	0.38
August	202	36	61.5	0.325	0.37
September	150	32	54.7	0.289	0.32
October	49	25	325	0.172	0.20
November	355	30	118	0.624	0.70
December, 1-10	192	92	134	0.709	0.26

SUSQUEHANNA RIVER DRAINAGE BASIN.

DESCRIPTION OF SUSQUEHANNA RIVER.

Susquehanna river rises in Otsego lake, in northern Otsego county, N. Y., at an elevation of 1,193 feet above tide and flows in a general southerly direction into Chesapeake bay. Its course is in many places extremely tortuous, crossing the state boundary between New York and Pennsylvania three times. The entire length of the river is about 500 miles, and it drains an area of 27,400 square miles, of which 21,060 square miles lie in Pennsylvania, 6,080 in New York, and 260 in Maryland.

The topography of the basin varies widely in character. In New York the stream and its tributaries flow through a rolling and in places rather broken country. In this part of the course its bed is of gravel or sand, with occasional rock ledges, and its banks are moderately high and not extensively subject to overflow. In Pennsylvania the river enters a mountain region, its banks are high, and it winds and twists among the parallel ranges in a bed composed generally of drift materials, gravel, sand and boulders. In the lower part of its course, from Marietta to Harve de Grace, it occupies a broad, deep valley, varying in width from a few hundred feet to more than a mile, and is for the most part bounded on either shore by rocky bluffs and table-lands elevated from 100 to 500 feet above its waters.

SUSQUEHANNA RIVER AT BINGHAMTON, N. Y.

This station was established July 31, 1901, by Robert E. Horton, and has since been maintained by the U. S. Geological Survey in coöperation with this Department. It is located at the Washington street bridge, about 800 feet up-stream from the junction of Chenango and Susquehanna rivers.

On account of the unfavorable conditions produced by a rift, which extends diagonally across the stream underneath the Washington street bridge, discharge measurements are made at the Exchange street bridge, 1,900 feet up-stream.

A standard chain gage is attached to the up-stream side of the left span of the Washington street bridge. The gage is up-stream from the crest of the rift and over a stretch of smooth water extending to the dam, 2,800 feet above. Gage readings are unaffected by backwater from Chenango river at ordinary stages. The gage is read twice each day by William Ray Monroe. The bench-mark is a chisel draft on the corner of the left bridge abutment on the up-stream side. Its assumed elevation is 100.00. The elevation of water-surface, when the gage reads zero, is 76.29.

Mean Daily Gage Height, in Feet, of Susquehanna River at Binghamton, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	2.20	3.15	14.95	3.85	3.50	3.55	2.40	1.75	1.80	2.10	1.90	2.50
2	2.10	3.00	17.65	3.60	3.50	3.70	2.35	1.90	1.80	2.10	1.95	2.50
3	2.10	3.00	15.45	3.40	3.60	3.65	2.30	1.80	1.88	2.00	1.90	2.45
4	2.05	3.00	13.40	3.20	4.55	3.30	2.30	1.75	1.80	2.00	1.90	2.40
5	2.45	2.80	10.60	3.15	4.00	3.10	2.20	1.80	1.85	2.00	2.00	2.40
6	2.20	3.00	10.20	3.05	3.70	3.25	2.20	1.80	1.90	1.95	2.00	2.30
7	2.60	2.50	12.25	3.00	3.20	4.40	2.15	1.75	2.20	2.05	2.00	2.15
8	2.75	2.50	11.20	3.00	3.10	4.90	2.15	1.70	2.05	2.05	2.20	2.30
9	2.65	2.50	9.10	3.10	3.10	4.30	2.20	1.75	2.00	1.95	2.20	2.28
10	2.60	2.80	7.22	2.90	3.15	3.80	2.10	1.80	2.00	2.05	2.20	2.10
11	2.45	2.65	6.20	2.90	3.10	3.65	2.10	1.90	1.85	2.00	3.00	2.20
12	2.35	2.60	5.60	2.90	3.00	4.50	2.15	1.85	1.90	1.95	2.85	2.20
13	2.40	2.60	5.60	3.30	2.85	4.50	2.00	1.85	1.95	1.80	2.80	2.20
14	2.40	2.40	5.40	3.10	2.75	4.05	1.95	1.80	1.95	1.80	2.65	......
15	2.30	2.55	4.95	2.90	2.70	3.55	1.95	1.80	1.90	1.90	2.55	......
16	2.30	2.55	4.60	2.70	2.60	3.30	2.00	1.80	1.90	1.70	2.60	......
17	2.35	2.60	4.25	2.60	2.55	3.35	2.00	1.85	1.85	1.90	2.50	2.20
18	2.30	2.75	4.00	2.65	2.50	3.30	2.00	1.85	1.80	1.88	2.45	2.30
19	2.60	2.70	3.80	2.80	2.50	4.30	1.95	1.80	1.95	1.85	2.40	2.20
20	3.20	2.80	4.10	3.35	2.50	3.85	1.95	1.85	1.90	1.90	2.40	2.20
21	3.60	2.80	5.65	3.15	2.50	3.50	1.90	1.75	1.95	1.85	2.40	2.15
22	9.00	3.70	5.80	3.00	2.40	3.05	2.00	1.70	1.85	1.85	2.25	2.22
23	9.10	4.10	5.55	2.90	2.50	2.85	1.90	1.80	1.85	1.70	2.30	2.20
24	7.70	3.90	5.70	2.90	2.40	2.70	1.85	1.80	1.90	1.90	2.35	2.25
25	6.00	3.40	5.90	3.25	2.55	2.65	1.90	1.80	1.70	1.85	2.50	2.60
26	4.95	3.55	6.35	3.25	6.50	2.60	1.90	1.75	1.85	1.90	2.60	2.75
27	4.25	3.20	5.90	4.10	5.70	2.50	1.95	1.80	1.85	1.85	2.55	2.65
28	4.00	9.75	5.10	4.10	4.90	2.55	1.90	1.75	1.95	1.90	2.50	2.55
29	3.75	......	4.50	3.60	4.10	2.50	1.90	1.70	1.75	1.80	2.50	2.75
30	3.10	......	4.30	3.65	3.55	2.50	1.90	1.80	1.90	1.65	2.50	4.40
31	3.15	......	4.00	......	3.50	......	1.85	1.75	......	1.90	......	5.10

Current-meter Discharge Measurements of Susquehanna River at Binghamton, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1910.						
March 8 *a*	W. G. Hoyt	11.55	389	4,340	5.69	24,700
May 7 *b*	C. C. Covert	3.32	421	993	3.78	3,750
July 26 *c*	W. G. Hoyt	1.95	312	343	1.59	545

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a Surface velocity measurement; floating ice and debris; coefficient of 0.9 used; made from Exchange street bridge.

b Measurement made at Washington street bridge.

c Measurement made at Washington street, partly by wading and from bridge.

Mean Daily Discharge, Second-feet, of Susquehanna River at Binghamton, N. Y.

DAY	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	1,150	3,440	43,400	5,210	4,320	4,440	1,610	272	335	920	500	1,850
2	920	3,070	54,100	4,570	4,320	4,820	1,500	500	335	920	600	1,850
3	920	3,070	45,400	4,070	4,570	4,700	1,380	335	467	700	500	1,730
4	810	3,070	37,400	3,570	7,060	3,820	1,380	272	335	700	500	1,610
5	1,730	2,570	27,300	3,440	5,600	3,320	1,150	335	418	700	700	1,610
6	1,150	3,070	25,800	3,200	4,820	3,700	1,150	335	500	600	700	1,380
7	2,090	1,850	33,200	3,070	3,570	6,650	1,040	272	1,150	810	700	1,040
8	2,450	1,850	29,400	3,070	3,320	8,000	1,040	210	810	810	1,150	1,380
9	2,210	1,850	21,900	3,320	3,320	6,380	1,150	272	700	600	1,150	1,330
10	2,090	2,570	15,300	2,820	3,440	5,080	920	335	700	810	1,150	920
11	1,730	2,210	12,000	2,820	3,320	4,700	920	500	418	700	3,070	1,150
12	1,500	2,090	10,100	2,820	3,070	6,920	1,040	418	500	600	2,700	1,150
13	1,610	2,090	10,100	3,820	2,700	6,920	700	418	600	335	2,570	1,150
14	1,610	1,610	9,500	3,320	2,450	5,730	600	335	600	335	2,210	1,150
15	1,380	1,970	8,140	2,820	2,330	4,440	600	335	500	500	1,970	1,150
16	1,380	1,970	7,190	2,330	2,090	3,820	700	335	500	210	2,090	1,150
17	1,500	2,090	6,250	2,090	1,970	3,940	700	418	418	500	1,850	1,150
18	1,380	2,450	5,600	2,210	1,850	3,820	700	418	335	467	1,730	1,380
19	2,090	2,330	5,080	2,570	1,850	6,380	600	335	600	418	1,610	1,150
20	3,570	2,570	5,860	3,940	1,850	5,210	600	418	500	500	1,610	1,150
21	4,570	2,570	10,300	3,440	1,850	4,320	500	722	600	418	1,610	1,040
22	21,500	4,820	10,800	3,070	1,610	3,200	700	210	418	418	1,260	1,200
23	21,900	5,860	10,000	2,820	1,850	2,700	500	335	418	210	1,380	1,150
24	16,900	5,340	10,400	2,820	1,610	2,330	418	335	500	500	1,500	1,200
25	11,400	4,070	11,100	3,700	1,970	2,210	500	335	210	418	1,850	2,090
26	8,140	4,440	12,500	3,700	13,000	2,090	500	272	418	500	2,090	2,450
27	6,250	3,570	11,100	5,860	10,400	1,850	600	335	418	418	1,970	2,210
28	5,600	24,200	8,580	5,860	8,000	1,970	500	272	600	500	1,850	1,970
29	4,950	......	6,920	4,570	5,860	1,850	500	210	272	335	1,850	2,450
30	3,320	......	6,380	4,700	4,440	1,850	500	335	500	162	1,850	6,650
31	3,440	......	5,600	......	4,320	......	418	272	......	500	......	8,580
Mean	4,540	3,670	16,700	3,520	3,960	4,240	810	331	502	533	1,540	1,850

Monthly Discharge of Susquehanna River at Binghamton, N. Y.

[Drainage area, 2,400 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
January	21,900	810	4,540	1.89	2.18
February	24,200	1,610	3,670	1.53	1.59
March	5,410	5,080	16,700	6.96	8.02
April	5,860	2,090	3,520	1.47	1.64
May	13,000	1,610	3,960	1.65	1.90
June	8,000	1,850	4,240	1.77	1.98
July	1,610	418	810	0.338	0.39
August	500	210	331	0.138	0.16
September	1,150	210	502	0.209	0.23
October	920	162	533	0.222	0.26
November	3,070	500	1,540	0.642	0.72
December	8,580	920	1,850	0.771	0.89
The year	24,200	162	3,520	1.47	19.96

NOTE.— Estimates during frozen period provisional and are subject to revision for purpose of publication in the Federal 1910 report.

CHENANGO RIVER AT BINGHAMTON, N. Y.

The gaging station, which was established July 31, 1901, by Robert E. Horton, has since been maintained by the U. S. Geological Survey in coöperation with this Department. It is located at the Court street bridge, Binghamton.

The bridge to which the gage is attached stands squarely across the stream at a point where there is a good bed of gravel and small cobblestones and a smooth, uniform current. The channel is obstructed by three masonry piers supporting the four spans of the bridge, 79 feet clear width each, the bridge having a total length of 337 feet between abutments. A small rift between the station and the confluence of Chenango river with the Susquehanna, about 2,500 feet below, cuts off backwater at ordinary stages of the rivers. For periods during freshets or at times when there is an abnormal rise on one or both streams, either record may be affected by backwater and too great a discharge indicated.

A standard chain gage is attached to the hand-rail of the bridge on the up-stream side of the first span from the right bank. The gage is read by William Ray Monroe. The bench-mark is a circular chisel draft on the up-stream corner of the bridge-seat on the left abutment. Its assumed elevation is 100.00. The elevation of water-surface, when the gage reads zero is 65.98.

In estimating the run-off of Chenango river, the area directly tributary to storage reservoirs, from which diversion is made to supply Erie canal, has been deducted from the total natural drainage area. The diversion area of six reservoirs at the head of Chenango river, whose outflow is turned into Erie canal through Oriskany creek, is about 30 square miles. The diversion area of De Ruyter reservoir, at the head of Tioughnioga river, whose outflow is turned into Erie canal through Limestone creek, is 18.2 square miles. These two areas have been subtracted from the natural drainage area of 1,580 square miles, giving an effective area of 1,532 square miles. This estimate is approximate, as no allowance for direct inflow to feeder channels from additional areas, nor for waste into the original stream, has been made. The gross area, from which more or less run-off is diverted, is about 105 square miles.

Mean Daily Gage Height, in Feet, of Chenango River at Binghamton, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1.....	5.25	6.40	18.25	7.20	6.50	6.95	5.40	5.10	5.20	5.80	5.40	6.40
2.....	5.25	6.25	21.40	6.95	6.90	......	5.40	5.10	5.10	5.70	5.40	6.30
3.....	5.30	6.40	19.00	6.70	6.85	6.75	5.30	5.20	5.05	5.60	5.20	6.25
4.....	5.25	6.30	16.75	6.50	8.75	......	5.35	5.15	5.20	5.60	5.30	6.20
5.....	5.35	6.10	14.15	6.45	7.75	6.30	5.30	5.15	5.35	5.50	5.50	6.20
6.....	5.20	6.10	13.90	6.35	7.20	7.25	5.30	5.15	5.50	5.45	5.45	6.00
7.....	5.30	5.75	15.75	6.30	6.80	7.75	5.30	5.15	5.60	5.45	5.90	5.90
8.....	5.30	5.70	14.60	6.40	6.60	7.90	5.30	5.15	5.70	5.45	5.90	5.95
9.....	5.40	5.95	12.50	6.30	6.50	7.15	5.30	5.15	5.65	5.35	5.85	5.80
10.....	5.40	6.05	10.45	6.30	6.75	5.25	5.25	5.20	5.40	5.45	6.00	5.65
11.....	5.40	6.00	9.40	6.15	6.50	6.75	5.20	5.10	5.30	5.45	7.15	5.80
12.....	5.30	5.85	8.95	6.35	6.45	7.90	5.20	5.20	5.35	5.35	7.10	5.85
13.....	5.35	5.80	9.00	6.40	6.25	7.60	5.20	5.20	5.30	5.40	6.75	5.90
14.....	5.30	5.75	8.80	6.15	6.15	7.10	5.15	5.20	5.60	5.40	6.55	5.80
15.....	5.20	5.85	8.30	6.05	6.10	6.60	5.10	5.20	5.45	5.40	6.48	5.90
16.....	5.30	5.90	7.80	6.00	6.00	6.50	5.20	5.15	5.30	5.05	6.45	5.75
17.....	5.30	5.95	7.70	5.90	5.90	6.85	5.25	5.20	5.25	5.40	6.35	5.60
18.....	5.40	6.00	7.30	5.90	5.90	6.45	5.30	5.20	5.10	5.40	6.25	5.70
19.....	5.60	5.95	7.25	6.30	6.00	6.90	5.10	5.20	5.10	5.30	6.25	5.85
20.....	6.30	5.90	7.90	6.35	5.90	6.50	5.10	5.10	5.40	5.35	6.20	5.80
21.....	6.70	6.10	9.40	6.20	6.05	6.20	5.10	5.20	5.20	5.10	6.10	5.85
22.....	12.20	6.65	9.30	6.10	6.30	5.95	5.10	5.20	5.20	5.30	6.10	5.70
23.....	12.50	7.10	9.25	6.00	6.15	5.80	5.10	5.15	5.20	5.00	6.05	5.65
24.....	10.95	6.75	9.30	5.90	6.10	5.75	5.00	5.15	5.10	5.30	6.10	5.80
25.....	9.20	6.40	9.55	6.15	6.85	5.65	5.10	5.25	5.05	5.30	6.55	6.10
26.....	8.10	6.70	9.80	6.70	10.10	5.60	4.95	5.20	5.25	5.20	6.85	6.20
27.....	7.60	6.10	9.40	7.00	8.85	5.55	5.05	5.15	6.10	5.35	6.70	6.10
28.....	7.35	12.65	8.35	6.70	8.25	5.50	5.10	5.10	5.90	5.35	6.40	6.05
29.....	7.10	......	7.90	6.30	7.50	5.55	5.30	5.10	6.50	5.35	6.40	6.15
30.....	6.50	......	7.60	6.65	7.00	5.45	5.20	5.10	6.00	5.20	6.35	7.70
31.....	6.40	......	7.40	......	7.05	......	5.20	5.15	......	5.40	......	8.50

Observer, W. L. Smith.

Current-Meter Discharge Measurements of Chenango River at Binghamton, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1910.						
March 7 *a*....	W. G. Hoyt..................	16.82	320	4,120	5.68	23,400
May 9.......	C. C. Covert..................	6.50	310	873	2.33	2,030
July 26 *b*.....	Hoyt and Carman............	4.95	160	186	0.71	132

a Subsurface coefficients.
b Measurement made at wading section below bridge.

Mean Daily Discharge, Second-feet, Chenango River at Binghamton, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1....	308	1,620	26,200	2,760	1,760	2,400	460	235	305	850	460	1,620
2....	308	1,410	(34,600)	2,400	2,320	(2,260)	460	235	235	745	460	1,480
3....	342	1,620	28,200	2,040	2,250	2,110	380	305	202	645	305	1,410
4....	308	1,480	22,400	1,760	5,300	(1,800)	420	270	305	645	380	1,340
5....	378	1,210	16,200	1,680	3,620	1,480	380	270	420	550	550	1,340
6....	275	1,210	15,600	1,550	2,760	2,840	380	270	550	505	505	1,080
7....	342	798	20,000	1,480	2,180	3,620	380	270	645	505	960	960
8....	342	745	17,300	1,620	1,900	3,860	380	270	745	505	960	1,020
9....	415	1,020	12,600	1,480	1,760	2,690	380	270	695	420	905	850
10....	415	1,140	8,420	1,480	2,110	2,110	342	305	460	505	1,080	695
11....	415	1,080	6,460	1,280	1,760	2,110	305	235	380	505	2,690	850
12....	342	905	5,650	1,550	1,680	3,860	305	305	420	420	2,620	905
13....	378	850	5,740	1,620	1,410	3,380	305	305	380	460	2,110	960
14....	342	798	5,390	1,280	1,280	2,620	270	305	645	460	1,820	850
15....	275	905	4,520	1,140	1,210	1,900	235	305	505	460	1,730	960
16....	342	960	3,700	1,080	1,080	1,760	305	270	380	202	1,680	798
17....	342	1,020	3,540	960	960	2,250	342	305	342	460	1,550	645
18....	415	1,080	2,920	960	960	1,680	380	305	235	460	1,410	745
19....	580	1,020	2,840	1,480	1,080	2,320	235	305	235	380	1,410	905
20....	1,330	960	3,860	1,550	960	1,760	235	235	460	420	1,340	850
21....	1,840	1,210	6,460	1,340	1,140	1,340	235	305	235	235	1,210	905
22....	12,000	1,960	6,280	1,210	1,480	1,020	235	305	305	380	1,210	745
23....	12,600	2,620	6,190	1,080	1,280	850	235	270	305	170	1,140	695
24....	9,400	2,110	6,280	960	1,210	798	170	270	235	380	1,210	850
25....	6,100	1,620	6,730	1,280	2,250	695	235	342	202	380	1,820	1,210
26....	4,180	2,040	7,190	2,040	7,760	645	142	305	342	305	2,250	1,340
27....	3,380	1,210	6,460	2,470	5,480	598	202	270	1,210	420	2,040	1,210
28....	2,990	12,900	4,610	2,040	4,440	550	235	235	960	420	1,620	1,140
29....	2,620	......	3,860	1,480	3,220	598	380	235	1,760	420	1,620	1,280
30....	1,760	......	3,380	1,960	2,470	505	305	235	1,080	305	1,550	3,540
31....	1,620	......	3,060	......	2,540	....	305	270	......	460	......	4,860
Mean.	2,150	1,700	9,890	1,570	2,310	1,880	308	278	508	451	1,350	1,230

Monthly Discharge of Chenango River at Binghamton, N. Y.

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
January	12,600	(275)	2,150	1.41	1.63
February	12,900	745	1,700	1.11	1.16
March	(34,600)	2,840	9,890	6.46	7.45
April	2,760	960	1,570	1.03	1.15
May	7,760	960	2,310	1.51	1.74
June	3,860	505	1,880	1.23	1.37
July	460	142	308	0.201	0.23
August	342	235	278	0.182	0.21
September	1,760	202	508	0.332	0.37
October	850	170	451	0.295	0.34
November	2,690	305	1,350	0.882	0.98
December	4,860	645	1,230	0.804	0.93
The year	(34,600)	142	1,970	1.29	17.56

NOTE.—Estimates during frozen periods provisional and subject to revision for the purpose o publication in the Federal 1910 report.

CHEMUNG RIVER,

DESCRIPTION.

Chemung river is formed at Painted Post, N. Y., by the confluence of Tioga and Cohocton rivers. Cohocton river lies entirely in the state of New York. Tioga river receives, just above its mouth, Canisteo river, a large tributary, which also has its drainage basin in New York to the south of Cohocton. The drainage area of Tioga river, above the Canisteo, is mainly in Pennsylvania. Chemung river flows southeastward through Corning, Elmira and Chemung, crosses the state line and flows for a short distance in Pennsylvania, then returns to New York, and crosses again to Pennsylvania near Waverly, finally emptying into the Susquehanna near Athens, Bradford county, Pa. The total length of the river is about 40 miles, of which 30 miles lie in New York;-the drainage area, measured at the mouth, is 2,520 square miles.

The topographic features of the basin are, as a rule, bold and broad. The hills rise to a height of several hundred feet on either side, within a short distance of the stream. The upland plateau is to a large extent wooded, has impervious soil, no lake storage, and few marsh areas. Tributaries are ramifying and uniformly distributed, though not very numerous, and dry gullies, or flood channels, are common. The main river is sluggish, with low banks and a broad valley or flood plain, which is often overflowed. The concentration of storm waters from the three large streams, which unite just above Corning, makes possible excessive floods. Dikes have been erected in the cities of Elmira and Corning for protection. One of the highest recorded freshets in the stream occurred June 1, 1889. It was preceded by phenomenal rainfall, aggregating several inches in a few hours during the night of May 31. The discharge at this time has been estimated at 67 second-feet per square mile from 2,055 square miles, or 138,000 second-feet.[a]

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[a] Report of Francis Collingwood, C. E., on the protection of the city of Elmira, N. Y. against floods.

CHEMUNG RIVER AT CHEMUNG, N. Y.

The gaging station was established September 7, 1903, by Robert E. Horton. It has since been maintained by the U. S. Geological Survey in coöperation with this Department. It is located at the suspension highway bridge, midway between Chemung, N. Y., and Willawana, Pa., near the state line.

The channel is straight for 700 feet above and 800 feet below the station. The right bank is high, cleared, and not subject to overflow; the left bank is medium height, wooded, and will overflow at high water. The bed of the stream is composed of gravel and is clean and permanent. The current is good. There is but one channel at all stages.

Discharge measurements are made from the down-stream side of the bridge, which has a single span of 395 feet. The initial point for soundings is the face of the right abutment on the downstream side.

A standard chain gage is attached to the up-stream side of the bridge, near the right bank, and is read twice each day by Daniel L. Orcutt. The bench-mark is formed by three nails driven into a telephone pole 70 feet to the right of the initial point for soundings and about 30 feet up-stream. The pole is marked with black paint "U. S. G. S. B. M." Elevation of bench-mark is assumed at 100.00. The elevation of water-surface, when the gage reads zero, is 70.12.

The smooth water reaches of the stream became ice-covered in winter. Needle ice forms over the rapids and is carried under the surface ice. Much of the winter flow apparently filters through these beds of needle ice at times. The conditions render the estimation of the daily discharge in winter impracticable.

Mean Daily Gage Height, in Feet, of Chemung River at Chenango, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	......	2.94	14.62	3.56	7.00	3.65	2.36	1.78	1.72	2.36	1.78	2.84
2	......	2.84	14.48	3.38	8.40	3.51	2.31	1.84	1.72	2.13	1.81	2.86
3	......	3.00	12.90	3.21	8.15	3.38	2.25	1.86	1.76	2.08	1.82	2.60
4	......	2.76	10.86	3.14	9.24	3.24	2.21	1.86	1.81	2.06	1.84	2.61
5	......	2.60	9.46	3.24	7.47	3.19	2.22	1.80	1.86	1.92	1.83	2.57
6	......	3.67	9.83	3.24	6.31	3.13	2.19	1.73	1.88	1.94	1.77	2.40
7	......	......	11.92	3.13	5.57	3.15	2.23	1.75	2.04	1.90	1.76	2.62
8	......	......	9.46	3.00	5.07	3.15	2.13	1.72	2.01	1.80	1.77	2.57
9	......	......	7.38	3.00	4.79	3.08	2.19	1.76	2.04	1.83	1.80	2.50
10	......	......	6.26	2.92	4.69	2.91	2.08	1.82	2.05	1.86	1.83	2.40
11	......	......	5.68	2.74	4.37	3.03	2.10	1.80	2.38	1.86	1.89	......
12	......	......	5.36	2.70	4.08	3.35	2.11	1.84	1.85	1.81	1.91	......
13	......	......	5.16	2.71	3.87	3.33	......	1.87	1.92	1.76	1.98	......
14	......	......	5.04	2.66	3.66	3.13	......	1.86	1.78	1.78	2.12	......
15	......	......	4.58	2.50	3.51	2.99	2.48	1.74	1.76	1.79	2.14	......
16	......	......	4.38	2.52	3.41	2.87	2.17	1.82	1.78	1.74	2.04	......
17	......	......	4.30	2.48	3.29	3.37	2.10	1.80	1.74	1.64	3.20	......
18	......	......	4.08	2.51	3.19	4.15	2.12	1.75	1.78	1.72	2.18	......
19	......	......	3.98	4.14	3.09	4.85	2.08	1.76	1.71	1.71	2.20	......
20	......	......	4.65	4.88	3.04	3.93	2.06	1.74	1.74	1.70	2.13	......
21	......	......	6.25	5.36	3.13	3.49	2.02	1.74	1.72	1.60	2.10	......
22	11.62	......	5.92	4.04	3.16	3.21	1.94	1.71	1.78	1.66	2.08	......
23	8.76	......	5.87	4.64	3.10	3.01	1.96	1.80	1.67	1.62	2.08	......
24	6.01	......	5.82	8.08	3.43	2.85	1.96	1.78	1.72	1.62	2.05	......
25	5.00	......	5.82	16.56	4.65	2.74	1.98	1.75	1.72	1.72	2.09	......
26	4.26	......	5.66	14.10	6.01	2.47	2.02	1.70	1.85	1.68	2.14	......
27	3.97	......	5.02	10.76	5.07	2.53	1.87	1.74	1.83	1.73	2.38	......
28	3.71	11.18	4.61	7.39	4.50	2.47	1.92	1.73	2.58	1.76	2.42	......
29	3.46	......	4.24	6.16	4.05	2.40	1.89	1.68	2.62	1.78	2.50	......
30	3.04	......	4.00	9.00	3.80	2.41	1.87	1.74	2.49	1.78	2.64	......
31	3.08	......	3.80	......	3.75	......	1.86	1.72	......	1.78	......	......

Current-meter Discharge Measurements of Chemung River at Chemung, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
1910.		*Feet.*	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
July 25 *a*	W. G. Hoyt	1.99	204	243	0.96	233

a Measurement made at wading section.

Mean Daily Discharge, Second-feet, of Chemung River at Chemung, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	......	888	42,400	1,500	9,220	1,710	444	133	112	444	133	799
2	......	800	41,700	1,360	13,600	1,520	412	156	112	298	144	816
3	......	945	33,000	1,160	12,800	1,360	372	164	126	269	148	610
4	......	733	23,400	1,090	16,700	1,200	346	164	144	258	156	618
5	......	610	17,500	1,200	10,600	1,140	353	140	164	189	152	589
6	......	......	19,000	1,200	7,360	1,080	334	116	172	198	130	470
7	......	......	28,300	1,080	5,460	1,100	360	122	247	180	126	625
8	......	......	17,500	945	4,270	1,100	298	112	230	140	130	589
9	......	......	10,300	945	3,670	1,020	334	126	247	152	140	540
10	......	......	7,230	869	3,470	860	269	148	252	164	152	470
11	......	......	5,730	717	2,860	975	280	140	457	164	176	......
12	......	......	4,940	685	2,360	1,320	286	156	160	144	184	......
13	......	......	4,480	693	2,030	1,300	(286)	168	189	126	216	......
14	......	......	4,210	656	1,720	1,080	(526)	164	133	133	292	......
15	......	......	3,250	540	1,520	936	526	119	126	136	304	......
16	......	......	2,870	554	1,400	825	322	148	133	119	247	......
17	......	......	2,730	536	1,250	1,350	280	140	119	87	340	......
18	......	......	2,340	547	1,140	2,480	292	122	133	112	328	......
19	......	......	2,200	2,460	1,040	3,800	269	126	108	108	340	......
20	......	......	3,390	3,860	985	2,120	258	119	119	105	298	......
21	......	......	7,200	4,940	1,080	1,500	236	119	112	75	280	......
22	26,900	......	6,340	2,290	1,110	1,160	198	108	133	93	269	......
23	14,900	......	6,210	3,370	1,040	955	207	140	96	81	269	......
24	6,580	......	6,080	12,600	1,420	808	207	133	112	81	252	......
25	4,120	......	6,080	52,100	3,390	717	216	122	112	112	274	......
26	2,660	......	5,680	39,800	6,580	519	236	105	160	99	304	......
27	2,180	......	4,160	22,900	4,270	561	168	119	152	116	457	......
28	1,790	24,800	3,310	10,400	3,100	519	189	116	596	126	484	......
29	1,460	......	2,630	6,970	2,310	470	176	99	625	133	540	......
30	985	......	2,230	15,800	1,920	477	168	119	533	133	640	......
31	1,020	......	1,920	......	1,850	......	164	112	......	133	......	......
Mean	......	......	10,600	6,460	4,240	1,200	291	131	204	152	264	......

Monthly Discharge of Chemung River at Chemung, N. Y.

[Drainage area, 2,440 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
March	42,400	1,920	10,600	4.34	5.00
April	52,100	536	6,460	2.65	2.96
May	16,700	985	4,240	1.74	2.01
June	3,800	470	12,000	0.492	0.55
July	(526)	164	291	0.119	0.14
August	168	99	131	0.054	0.062
September	625	96	204	0.084	0.094
October	444	75	152	0.062	0.071
November	640	126	264	0.108	0.12

ALLEGHENY RIVER DRAINAGE BASIN.

DESCRIPTION OF ALLEGHENY RIVER.

Allegheny river, which, with the Monongahela, forms the Ohio at Pittsburg, rises in northern Pennsylvania, flows north into the state of New York, then flows south through western Pennsylvania. The headwaters have an elevation of about 2,500 feet and join those of Genesee river on the north and of the Susquehanna on the east. The total length from the source to the mouth at Pittsburg is about 300 miles, 47 of which are in the state of New York. The principal facts concerning this river have been given in a report by George Lehman, assistant engineer, contained in House Document No. 72, Fifty-fifth Congress, third session. Although this river drains a large area, much of which is of an elevated and even mountainous character, yet it is of comparatively small value for water-power. The total fall in 255 miles, between Olean, N. Y., and the mouth, is only 725 feet, or an average of less than 3 feet per mile. This descent is accomplished without abrupt pitches, and with few rapids having a fall of much consequence. The drainage basin of Allegheny river above Red House is comparatively rugged and precipitous. It is mostly covered with brush and light forest. A considerable amount of snow accumulates in the winter and feeds the stream until late in spring. The basin is underlain by shales of the Chemung series, and the depth of soil is usually small, excepting in stream valleys. There are no lakes and no artificial storage tributary to the stream. The Cuba reservoir, which feeds the Erie canal through Genesee river, lies on the divide between the Allegheny and Genesee drainage basins. A part of the overflow from this reservoir passes into the Allegheny, the rest passes into Genesee river. During about half of the year the river is navigable for small steamers to Franklin, 123 miles above Pittsburg.

ALLEGHENY RIVER AT RED HOUSE, N. Y.

This station was established September 4, 1903, by Robert E. Horton. It has since been maintained by the U. S. Geological Survey in coöperation with this Department. It is located at the Red House bridge, near the stations of the Erie and Pennsylvania railroads and about 5 miles below Salamanca, N. Y., about 13 miles above the point where the river leaves New York state. At Olean, N. Y., the wasteway from the Cuba reservoir enters the stream through Olean creek. This reservoir is located on the divide between Oil creek, tributary to Allegheny river, and Genesee river. The storage is commonly turned into Genesee river through the abandoned summit level of Genesee Valley canal, but may be diverted into Oil creek through the guard-lock at the head of the canal.

The channel is straight for 800 feet above and below the station, 494 feet wide between abutments, broken by two piers. The current velocity is well distributed. The right bank is high and does not overflow. The left bank overflows only at flood stages. At extreme high water there is an additional flood channel on the left bank. The bed is of gravel and is regular.

Discharge measurements are made from the down-stream side of the bridge. The initial point for soundings is the left end of the down-stream side of the bridge.

A standard chain gage is fastened to the up-stream side of the bridge near the middle of the left span; length of chain, 24.16 feet. The gage was read twice each day during 1910. The bench-mark is a circle cut on the down-stream side of the left abutment; assumed elevation, 100.00. The elevation of water-surface, when the gage reads zero, is 78.91.

Mean Daily Gage Height, in Feet of Allegheny River at Red House, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	4.0	......	10.5	5.0	7.0	4.5	3.0	3.0	3.02	3.10	4.35	5.00
2	......	......	13.6	5.0	7.0	4.5	3.0	3.0	3.12	3.10	4.40	4.90
3	......	......	11.4	5.0	7.5	4.5	3.0	2.8	3.20	3.10	4.50	4.85
4	......	......	11.0	4.8	8.0	4.5	3.0	2.75	3.35	3.02	4.60	4.60
5	......	5.0	10.9	4.5	8.0	4.5	3.0	2.7	3.80	2.98	4.55	4.55
6	......	......	10.3	4.5	7.0	4.5	3.0	5.7	5.50	3.27	2.25	4.40
7	......	......	10.5	4.5	7.0	4.5	3.0	2.7	5.62	3.88	4.25	4.20
8	4.0	......	9.5	4.5	7.0	4.5	3.0	2.7	4.80	3.80	4.00	4.10
9	......	......	9.1	4.2	7.0	4.5	3.0	2.7	4.40	3.61	3.90	4.00
10	......	......	9.0	4.0	6.5	4.0	3.0	3.0	4.12	3.40	4.40	4.00
11	......	......	9.0	4.0	6.5	4.0	3.5	3.1	3.80	3.28	5.70	3.95
12	......	4.5	8.8	4.0	6.0	4.0	3.5	3.1	3.60	3.20	5.50	3.95
13	......	......	8.0	4.1	6.0	4.0	3.5	3.0	3.52	3.05	4.60	3.90
14	......	......	7.4	4.1	6.0	4.0	4.0	3.0	3.40	3.00	4.90	3.90
15	4.0	......	6.0	3.8	5.5	4.0	4.0	2.9	3.32	3.00	4.90	3.90
16	......	......	5.6	3.6	5.5	3.5	4.0	2.9	3.18	3.00	4.80	3.95
17	......	......	5.5	3.6	5.0	3.5	4.0	2.9	3.15	3.00	4.75	3.95
18	......	......	5.5	3.8	4.0	3.5	3.5	2.9	3.10	3.00	4.60	3.95
19	......	4.5	5.4	3.8	4.0	4.0	3.5	3.0	3.10	3.05	4.65	3.95
20	......	......	6.0	5.0	4.0	4.0	3.5	3.0	3.05	3.00	4.50	3.95
21	......	......	6.6	6.2	4.0	4.0	3.5	3.0	3.00	3.02	4.45	3.95
22	5.0	......	7.0	6.4	4.0	3.5	3.5	2.9	3.00	2.92	4.40	3.95
23	......	......	7.0	6.6	4.0	3.5	3.5	3.0	2.90	3.10	4.70	3.95
24	......	......	7.1	7.4	4.5	3.5	3.05	3.2	3.01	3.25	5.35	3.95
25	......	......	7.1	8.0	4.5	3.5	3.05	3.3	3.32	3.40	5.50	3.95
26	......	5.0	7.3	9.2	4.0	3.0	3.0	3.2	3.40	3.60	5.65	4.00
27	......	8.1	7.3	9.0	4.0	3.0	3.0	3.2	3.50	3.80	5.60	4.20
28	......	9.1	7.2	8.5	4.0	3.0	3.0	3.2	3.40	4.10	5.80	4.40
29	4.5	......	7.2	8.2	4.0	3.0	3.05	3.2	3.30	4.35	5.50	4.55
30	......	......	7.0	8.6	4.0	3.0	3.05	3.15	3.25	4.35	5.30	6.50
31	......	......	6.5	......	4.5	......	3.05	3.0	......	4.25	......	7.30

NOTE.— Mr. Jewet Snyder, observer January 1 to August 24, inclusive, was found to be unreliable; records for this period are questionable. Present observer, Mr. W. E. Coe, is considered reliable. Ice obstruction, January 1 to February 25, and December 12 to 27.

Current-meter Discharge Measurements of Allegheny River at Red House, N. Y.

DATE.	Hydrographer.	Gage height.	Width.	Area of section.	Mean velocity.	Discharge.
		Feet.	*Feet.*	*Square feet.*	*Feet per second.*	*Second-feet.*
1910.						
July 24 *a*	W. G. Hoyt	3.04	255	173	1.88	326
Aug. 25	C. C. Covert	3.30	344	1,050	0.611	604

a Wading below bridge.

Rating Table for Allegheny River at Red House, N. Y.

Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*
2.60	105	3.80	1,200
2.70	145	3.90	1,335
2.80	190	4.00	1,470
2.90	250	4.10	1,610
3.00	320	4.20	1,750
3.10	405	4.30	1,895
3.20	500	4.40	2,045
3.30	600	4.50	2,200
3.40	710	4.60	2,365
3.50	825	4.70	2,540
3.60	945	4.80	2,725
3.70	1,070		

Mean Daily Discharge, Second-feet, of Allegheny River at Red House, N. Y.

DAY.	Jan.	Feb.	Mar.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.												
1	......	......	23,600	3,130	8,740	2,200	320	320	337	405	1,970	3,130
2	......	......	41,000	3,130	8,740	2,200	320	320	424	405	2,040	2,920
3	......	......	28,400	3,130	10,400	2,200	320	190	500	405	2,200	2,820
4	......	......	26,200	2,720	12,300	2,200	320	168	655	337	2,360	2,360
5	......	3,130	25,600	2,200	12,300	2,200	320	145	1,200	360	2,280	2,280
6	......	......	22,600	2,200	8,740	2,200	320	145	320	570	2,120	2,040
7	......	......	23,600	2,200	8,740	2,200	320	145	4,620	1,310	1,820	1,750
8	......	......	18,800	2,200	8,740	2,200	320	145	2,720	1,200	1,470	1,610
9	......	......	17,000	1,750	8,740	2,200	320	145	2,040	958	1,340	1,470
10	......	......	16,500	1,470	7,150	1,470	320	320	1 640	710	2,040	1,470
11	......	......	16,500	1,470	7,150	1,470	825	405	1,200	580	4,830	1,400
12	......	2,200	15,700	1,470	5,660	1,470	825	405	945	4,320	4,320	1,260
13	......	......	12,300	1,610	5,660	1,470	825	320	849	362	2,360	1,200
14	......	......	10,100	1,610	5,660	1,470	1,470	320	710	320	2,920	1,200
15	......	......	5,660	1,200	4,320	1,470	1,470	250	622	320	2,920	1,200
16	......	......	4,570	945	4,320	825	1,470	250	481	320	2,720	1,260
17	......	......	4,320	945	3,130	825	1,470	250	452	320	2,630	1,260
18	......	......	4,320	1,200	1,470	825	825	250	405	320	2,360	1,260
19	......	2,200	4,060	1,200	1,470	1,470	825	320	405	362	2,450	1,260
20	......	......	5,660	3,130	1,470	1,470	825	320	362	320	2,200	1,260
21	......	......	7,460	6,240	1,470	1,470	825	320	320	337	2,120	1,260
22	3,130	......	8,740	6,840	1,470	825	825	250	320	264	2,040	1,260
23	......	......	8,740	7,460	1,470	825	825	320	250	405	2,540	1,260
24	......	......	9,070	10,000	2,200	825	362	500	328	550	3,940	1,260
25	......	......	9,070	12,300	2,200	825	362	600	622	710	4,320	1,260
26	......	3,130	9,740	17,400	1,470	320	320	500	710	945	4,700	1,400
27	......	12,700	9,740	16,500	1,470	320	320	500	825	1,200	4,570	1,750
28	......	17,000	9,400	14,400	1,470	320	320	500	710	1,610	5,100	2,040
29	2,200	......	9,400	13,100	1,470	320	362	500	600	1,970	4,320	2,280
30	......	......	8,740	14,800	1,470	320	362	452	550	1,970	3,820	7,150
31	......	......	7,150	......	2,200	......	362	320	......	1,820	......	9,740
Mean	......	......	13,700	5,270	4,940	1,350	622	319	1,000	713	2,890	2,100

Monthly Discharge of Allegheny River at Red House, N. Y.
[Drainage area, 1,640 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on drainage area.
1910.					
March	41,000	4,060	13,700	8.35	9.63
April	17,400	945	5,270	3.21	3.58
May	12,300	1,470	4,940	3.01	3.47
June	2,200	320	1,350	0.823	0.92
July	1,470	320	622	0.379	0.44
August	600	145	319	0.195	0.22
September	4,620	250	1,000	0.610	0.68
October	1,970	264	713	0.435	0.50
November	5,100	1,340	2,890	1.76	1.96
December	9,740	1,200	2,100	1.28	1.48

NOTE.— The above estimates of discharge for winter periods are provisional and subject to revision for purpose of publication in the Federal report.

SUPPLEMENTAL GAGING RECORDS.

The data for the following gaging stations became available too late for insertion at their proper places in the report. They are accordingly given in the following pages.

CATTARAUGUS CREEK DRAINAGE BASIN.

DESCRIPTION.

Cattaraugus creek rises in the southwestern part of Wyoming county and flows in a westerly direction, entering Lake Erie about twenty-five miles southwest of Buffalo, on the boundary line between Erie and Chautauqua counties. The stream is about fifty-five miles in length and drains an area of approximately 560* square miles above the mouth. A large portion of its course forms the boundary between Erie and Chautauqua counties. Its head waters rise at an elevation of between 1,900 to 2,000 feet. The drainage basin is hilly, fairly well timbered and rather narrow. There are few tributary streams, those of most importance entering the river from the south.

South branch of Cattaraugus creek, which is the largest tributary, enters at a point about two miles above Gowanda. There is a dam at Gowanda which is used for developing electric power and also for running a local grist mill and foundry. Formerly there was a developement at Versallies, but a flood a few years ago washed the dam out and at present the developments at Gowanda are practically the only ones on the stream.

The average rainfall on the drainage basin is approximately forty inches. A gaging station was established on this stream at Versailles, September 23, 1910.

CATTARAUGUS CREEK AT VERSAILLES, N. Y.

This station is located at the highway bridge in the village of Versailles, about eight miles above the mouth of the stream, six miles below Gowanda and three miles from Lawton Station on the Erie railroad. It was established September 23, 1910, by the State Water Supply Commission in coöperation with the U. S.

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* From sixth annual report of the State Water Supply Commission.

Geological Survey, to obtain information regarding the flow of Cattaraugus creek, the principal tributary to Lake Erie from New York.

A standard chain gage, reading from 2 feet to 21.5 feet, is located on the up-stream side of the bridge over the right-hand channel. The bridge consists of three spans of 117 feet each. Measurements are made from the down-stream side of the bridge. Discharge measurements and gage heights only are published.

Mean Daily Gage Height, in Feet, of Cattaraugus Creek at Versailles, N. Y.
[James A. Palmer, observer.]

DAY.	Sept.	Oct.	Nov.	Dec.	DAY.	Sept.	Oct.	Nov.	Dec.
1910.									
1	......	5.05	6.45	6.45	17	......	5.02	6.10	5.60
2	......	4.95	6.55	6.42	18	......	5.05	6.02	5.90
3	......	4.90	6.15	6.15	19	......	5.02	5.98	5.82
4	......	5.05	5.78	5.95	20	......	5.02	5.90	5.82
5	......	5.01	5.60	5.90	21	......	5.00	5.82	5.70
6	......	5.20	5.60	5.68	22	......	5.62	5.80	5.62
7	......	6.15	5.70	5.70	23	5.05	5.75	5.85	5.70
8	......	5.55	5.72	5.65	24	5.01	5.40	6.68	5.72
9	......	5.28	5.78	5.60	25	5.09	5.48	6.95	5.70
10	......	5.22	7.68	5.72	26	5.05	5.85	6.55	5.75
11	......	5.18	7.32	5.70	27	5.05	5.55	6.22	5.70
12	......	5.12	6.48	5.64	28	5.05	6.38	6.20	5.70
13	......	5.08	6.30	5.55	29	5.05	6.30	6.68	6.98
14	......	5.08	6.25	5.65	30	5.05	6.22	6.40	7.30
15	......	5.08	6.22	5.60	31	......	6.10	......	6.42
16	......	5.08	6.18	5.45					

Current-meter Discharge Measurements of Cattaraugus Creek at Versailles, N. Y.

DATE.	Hydrographer.	Width. section.	Area of	Mean velocity.	Gage height.	Dis-charge.
1910.		*Feet.*	*Square feet.*	*Feet per second.*	*Feet.*	*Second-feet.*
Aug. 24	C. C. Covert	118	167	0.886	5.02	148
Sept. 23	C. C. Covert	130	185	0.741	5.00	137

AUSABLE RIVER DRAINAGE BASIN.

DESCRIPTION.

The Ausable river is formed by the junction of the east and west branches which have their head waters in the northwestern part of Essex county. The east branch has its source in upper Ausable lake, at an elevation of 1,990 feet above sea level. The west branch is formed by several small streams which lie in the valley to the west and north of the east branch. Both branches flow north and east to their junction in the village of Ausable Forks, from which point the river flows northeast, entering Lake Champlain about ten miles south of Plattsburg and opposite and slightly north of the city of Burlington.

Throughout the entire course, the river is fed by small mountain streams, which enter at nearly right angles from the mountains on either side. There are few lakes in this drainage area to act as a regulator on the flow and, owing to the great differences of elevation throughout the area, the stream has what is called a flashy discharge, its fluctuations being large and rapid.

Owing to the fact that this basin lies on the eastern slope of the Adirondack mountains, the average rainfall is less than for those basins whose streams rise on the western and southern slopes, the mean yearly precipitation being about thirty-two inches.

About 6,000 water horse-power is developed at the present time, principally on the west branch.

AUSABLE RIVER AT AUSABLE FORKS, N. Y.

This station is located in the village of Ausable Forks, about fifteen miles above the mouth of the river, immediately below the junction of the east and west branches. It was established August 27, 1910, in coöperation with the U. S. Geological Survey, to obtain information regarding the flow of the Ausable river.

A standard chain gage is fastened to a cantilever arm on the right-hand bank about forty feet below the confluence of the east and west branches, in the village of Ausable Forks. Measurements during this year have been made farther down-stream by wading.

On December 7, 1910, there was installed, two miles below the gage, cable station, at which future measurements will be made.

The data here presented have been compiled from the reports of the New York State Water Supply Commission.

Mean Daily Gage Height, in Feet, of Ausable River at Ausable Forks, N. Y.
[H. Edward Miner, observer.]

DAY.	Sept.	Oct.	Nov.	Dec.	DAY.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.										
1	3.60	3.66	3.78	3.72	17	3.76	3.64	3.62	3.72	3.90
2	3.60	3.66	3.72	3.72	18	3.67	3.61	3.66	3.70	3.88
3	3.61	3.83	3.76	3.68	19	3.74	3.62	3.62	3.80	4.02
4	3.68	3.74	3.87	3.70	20	3.68	3.59	3.64	3.69	3.90
5	3.82	3.74	4.08	3.73	21	3.64	3.61	3.61	3.84	3.77
6	4.38	3.78	4.22	3.73	22	3.64	3.60	3.62	3.80	3.88
7	4.09	3.96	4.12	3.86	23	3.62	3.62	3.64	3.76	3.86
8	3.66	3.90	3.82	3.80	24	3.62	3.60	3.68	3.73	3.82
9	3.66	3.80	3.74	3.72	25	3.62	3.56	3.72	3.77	3.88
10	3.72	3.83	3.82	3.83	26	3.62	3.58	3.66	3.74	4.12
11	3.56	3.93	3.82	3.73	27	3.59	3.70	3.80	3.68	3.84
12	3.72	3.82	3.90	3.86	28	3.59	3.69	4.41	3.74	3.74
13	3.62	3.72	3.78	3.87	29	3.62	3.67	4.13	3.68	3.78
14	3.62	3.74	3.77	3.96	30	3.58	3.70	3.80	3.73	3.78
15	3.60	3.68	3.76	4.02	31	3.56	......	3.76	......	4.14
16	3.61	3.62	3.83	3.97						

Current-meter Discharge Measurements of Ausable River at Ausable Forks, N. Y.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
1910.		*Feet.*	*Square feet.*	*Feet per second.*	*Feet.*	*Second-feet.*
Aug. 17	W. G. Hoyt	207	314	1.04	3.77	*a* 327
Dec. 9	Covert and Shuttleworth	182	313	0.866	3.85	*b* 271

a Measurement made at wading section.
b Measurement made under partial ice cover at cable station.

Current-meter Discharge Measurements of Each Branch, Ausable River.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
1910.		*Feet.*	*Square feet.*	*Feet per second.*	*Feet.*	*Second-feet.*
Oct. 29	C. C. Covert	137	190	1.52	*17.75	289

* Distance to reference point.

ST. REGIS RIVER DRAINAGE.

DESCRIPTION.

The St. Regis river has its source in several small streams and lakes in the western part of Franklin county at an elevation of about 1,500 feet above the sea. It first flows in a northwesterly direction for about forty miles and then somewhat east of north for about twenty-eight miles to its mouth, in the St. Lawrence river near the state line. It has a drainage area of 664 square miles (State Water Supply Commission). The upper portion of its watershed consists of swamp and mountains, from which the forest has been largely cut. Upon leaving the plateau the stream descends for ten or fifteen miles through a rugged country with a succession of steep rapids and precipitous falls to the low lands bordering the St. Lawrence.

There are excellent opportunities for developing power in the descent, only a few of which have as yet been utilized. From the foot of the hills to the St. Lawrence, the slope of the river is moderate and rock out-crop not frequent, consequently favorable sites for power development are scarce.

ST. REGIS RIVER AT BRASHER CENTER, N. Y.

This station is located in the village of Brasher Center, five miles down-stream from Brasher Falls, and about twelve miles above the mouth of the river. It was established August 22, 1910, in coöperation with the U. S. Geological Survey, to obtain information regarding the flow of the St. Regis river.

A chain gage is located on the down-stream side of the bridge, over the right-hand channel. Low-water measurements have been made by wading about 500 feet above the bridge, and high-water measurements are made from the bridge. A rating table is not developed as yet and only discharge measurements and gage heights are published.

The data here presented have been compiled from the reports of the New York State Water Supply Commission.

Mean Daily Gage Height, in Feet, of St. Regis River at Brasher Center, near Brasher Falls, N. Y.
[George Myers, observer.]

DAY.	Sept.	Oct.	Nov.	Dec.	DAY.	Aug.	Sept.	Oct.	Nov.
1910.									
1	4.12	4.12	4.85	4.42	18	......	4.20	4.38	4.55
2	4.10	4.10	4.85	4.58	19	......	4.20	4.30	4.62
3	4.22	4.10	4.72	4.55	20	......	4.10	4.35	4.65
4	4.18	4.25	4.78	4.70	21	......	4.12	4.25	4.48
5	4.16	4.32	4.78	4.80	22	4.25	4.12	4.10	4.52
6	4.22	4.40	4.88	4.68	23	4.16	4.16	4.12	4.50
7	5.12	5.18	4.98	5.20	24	4.05	4.10	4.25	4.42
8	5.22	5.50	4.88	5.20	25	4.11	4.12	4.60	4.60
9	4.96	5.40	4.82	5.85	26	4.15	4.10	5.25	4.62
10	4.70	5.22	4.78	6.00	27	4.25	4.12	5.45	4.62
11	4.55	4.95	5.05	6.05	28	4.02	4.18	5.50	4.62
12	4.41	4.75	5.08	6.05	29	3.95	4.20	5.40	4.55
13	4,32	4.50	4.98	5.98	30	3.50	4.12	5.35	4.48
14	4.25	4.35	4.88	5.85	31	4.05	......	5.05	......
15	4.22	4.35	4.75	5.35					
16	4.25	4.25	4.78	5.50					
17	4.22	4.35	4.70	5.62					

NOTE.— Ice conditions Dec. 18–31. No gage heights during this period.

Current-meter Discharge Measurements of St. Regis River at Brasher Center, near Brasher Falls, N. Y.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Square feet.*	*Feet per second.*	*Feet.*	*Second-feet.*
1910.						
July 25	C. C. Covert	160	196	0.90	a 19.36	176
Aug. 20	W. G. Hoyt	216	359	1.40	4.48	b 505

a Distance to water-surface from reference point on first bridge above Helena.
b Measurement made at wading section, 200 feet up-stream from gage.

SALMON RIVER DRAINAGE BASIN.

DESCRIPTION.

Salmon river rises in the southwestern part of Lewis county and flows southward and then northward, entering Lake Ontario near Port Ontario. Its drainage area comprises about 285 square miles. The topography is generally rolling in character and the soil is sandy, rock lying near the surface in the upper part of the basin, where there are extensive tracts of virgin forest.

The mean annual precipitation is about thirty-five inches, and during the winter there is usually a heavy fall of snow, which often accumulates in the forest areas to a depth of several feet. The gradual melting of this snow, in the spring, tends to prevent high freshets.

The basin affords several opportunities for storage. At High Falls there is an undeveloped fall of about 110 feet, occurring in a very short distance. Considering its size, this river has rather important power possibilities.

A gaging station has been maintained in this river basin near Pulaski from 1900 to 1908 and 1910.

SALMON RIVER AT FOX'S BRIDGE, NEAR PULASKI, N. Y.

This station is located on the first highway bridge above the village of Pulaski and was established by Robert E. Horton for the U. S. Geological Survey, in coöperation with this Department, September 5, 1900. A vertical staff gage was attached to the up-stream end of the center pier, with its zero 11.59 feet below the bench mark, which is the top of the cap stone of the center pier.

This gage was removed by ice during the winter of 1901–1902 and then replaced July 23, 1902, by a chain gage, having its zero 12.79 feet below the original bench mark. The station was discontinued June 30, 1907, reëstablished August 16, 1908, and discontinued December 6, 1908. It was maintained during these periods in coöperation with this Department.

On July 14, 1910, it was reëstablished by the Survey in coöperation with the State Water Supply Commission of New York, for the purpose of obtaining general statistical data regarding the flow of Salmon river. The gage datum has remained permanent since July 23, 1902. Discharge measurements are made from the bridge or by wading.

The station can be reached by a short drive from either Pulaski or Richland. Conditions are poor for records during the winter, when the channel usually becomes clogged by ice. The open channel rating is fairly good.

Information regarding this station is contained in the reports of this Department and in the annual reports of the U. S. Geological Survey.

Mean Daily Gage Height, in Feet, of Salmon River at Fox's Bridge, near Pulaski, N. Y.

[Seymour J. Fox, observer.]

DAY.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	DAY.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1910.													
1	.....	2.50	3.47	2.58	3.10	3.20	17	2.72	2.85	2.65	2.62	3.42	3.30
2	.....	2.50	3.60	2.58	3.10	3.18	18	2.70	2.80	2.50	2.60	3.35	.....
3	.....	2.62	3.12	2.50	3.70	3.10	19	2.50	3.28	2.50	2.60	3.28	.....
4	.....	2.58	3.75	2.48	3.55	3.10	20	2.48	3.38	2.60	2.60	3.25	.....
5	.....	2.88	3.50	2.92	3.50	3.02	21	2.52	2.98	2.50	2.55	3.10	.....
6	.....	3.50	3.70	4.05	3.42	2.90	22	2.50	2.72	2.55	2.55	3.30	.....
7	.....	3.90	3.72	4.10	3.50	2.90	23	2.62	2.75	2.45	2.68	3.28	.....
8	.....	3.15	3.25	3.65	3.38	2.90	24	2.65	2.60	2.50	3.06	3.35	.....
9	.....	2.90	3.05	3.20	3.38	3.00	25	2.55	2.60	2.65	2.98	3.50	.....
10	.....	2.92	3.00	3.12	3.65	3.00	26	2.55	2.75	2.60	3.75	3.48	.....
11	.....	3.85	2.70	3.00	4.80	3.00	27	2.50	2.90	2.68	3.58	3.38	.....
12	.....	3.62	2.78	3.88	4.30	3.00	28	2.60	2.82	2.62	3.52	3.30	.....
13	.....	3.35	2.60	2.78	4.02	3.10	29	2.55	2.62	2.62	2.52	3.28	.....
14	2.78	2.85	2.62	2.70	3.75	3.05	30	2.50	2.50	2.68	3.38	3.28	.....
15	2.55	2.72	2.70	2.70	3.60	3.00	31	2.60	2.65	.....	3.22	.....	.....
16	2.58	2.62	2.60	2.68	3.52	3.00							

NOTE.—Ice conditions prevailed December 17–31. Gage heights discontinued during this period

Current-meter Discharge Measurements of Salmon River at Fox's Bridge, near Pulaski, N. Y.

DATE.	Hydrographer.	Width.	Area of section.	Mean velocity.	Gage height.	Discharge.
		Feet.	*Square feet.*	*Feet per second.*	*Feet.*	*Second-feet.*
1910.						
July 13	W. G. Hoyt	168	239	704	2.61	168
Aug. 25	W. G. Hoyt	169	234	774	2.61	*a* 181

a Measurement made at wading section.

Mean Daily Discharge, Second-feet, of Salmon River at Fox's Bridge, near Pulaski, N. Y.

DAY.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	DAY.	July.	Aug.	Sept.	Oct.	Nov.	Dec
1910.													
1	.....	140	676	172	420	480	17	229	290	200	188	636	.....
2	.....	140	780	172	420	468	18	220	265	140	180	582	.....
3	.....	188	432	140	870	420	19	140	532	140	180	532	.....
4	.....	172	920	133	740	420	20	133	605	180	180	512	.....
5	.....	305	700	325	700	376	21	148	355	140	160	420	.....
6	.....	700	870	1,240	636	315	22	140	229	160	160	545	.....
7	.....	1,070	890	1,300	700	315	23	188	242	122	212	532	.....
8	.....	450	512	825	605	315	24	200	180	140	365	582	.....
9	.....	315	392	480	605	365	25	160	180	200	355	700	.....
10	.....	325	365	432	825	365	26	160	242	180	920	684	.....
11	.....	1,020	220	365	2,420	365	27	140	315	212	764	605	.....
12	.....	798	256	1,050	1,570	365	28	180	275	188	716	545	.....
13	.....	582	180	256	1,200	420	29	160	188	188	716	532	.....
14	256	290	188	220	920	392	30	140	140	212	605	532	.....
15	160	229	220	220	780	365	31	180	200	.....	493	.....	.....
16	172	188	180	212	716	365							

NOTE.— Ice conditions prevailed December 17–31.

Monthly Discharge of Salmon River at Fox's Bridge, near Palaski, N. Y.
[Drainage area, 264 square miles.]

MONTH.	DISCHARGE IN SECOND-FEET.				RUN-OFF.
	Maximum.	Minimum.	Mean.	Per square mile.	Depth in inches on area.
1910.					
July 14–31	256	133	173	0.655	0.44
August	1,070	140	360	1.36	1.57
September	920	122	340	1.29	1.44
October	1,300	133	443	1.68	1.94
November	2,420	420	736	2.79	3.11
December 1–16	480	315	382	1.45	0.86

CONCLUSION.

The year 1910 was one of exceptional drought and the records for the year are of great value for permanent preservation, on that account. The preceding report contains a much more extensive collection of stream gaging data than has appeared in any preceding report on the subject for this state. For a great many stations the report contains the combined results of several years' work. It is believed that the records are, generally speaking, substantially accurate, but, as stated at several places in the report, further detailed study and comparison are needed to determine with certainty the run-off at some localities and to determine the comparative value of different records maintained on the same stream.

Respectfully submitted,
ROBERT E. HORTON,
Resident Engineer.

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